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THE IRON AGE

Published every Thursday Morning by David Williams Co., 14-16 Park Place, New York.

Vol. 79: No. 15. *New York, Thursday April 11, 1907* $5.00 a Year, including Postage. Single Copies, 15 Cents.

Reading Matter Contents.....page 1161
Alphabetical Index to Advertisers " 195
Classified List of Advertisers " 186
Advertising and Subscription Rates " 194

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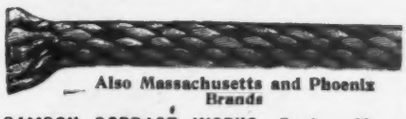

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See
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Ad. on Page 16

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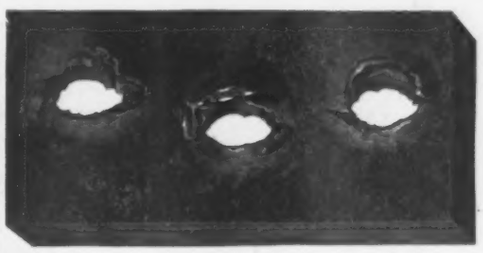

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See page 56

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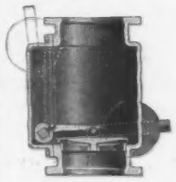

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"Swedoh" Cold Rolled Steel is unexcelled for **Drawing** and **Stamping**

THE AMERICAN TUBE & STAMPING COMPANY
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SEE PAGE 21

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Fac-Simile of Bar. Beware of Imitations.

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THE IRON AGE

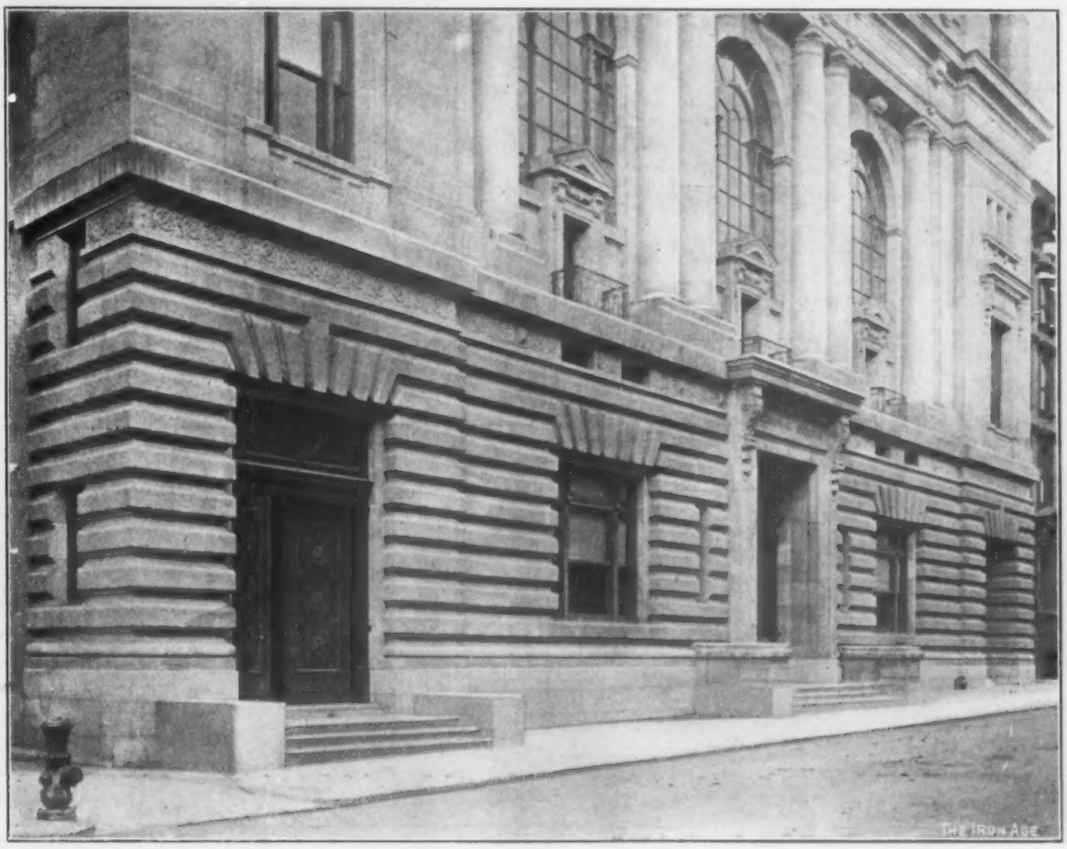
New York, Thursday, April 11, 1907.

THE ENGINEERING SOCIETIES BUILDING.

To Be Dedicated April 16 and 17, 1907.

In the issue of *The Iron Age* for December 14, 1905, a description was published of the building then under contract of erection in New York City for the joint use of the various engineering societies making their headquarters in that city. That article gave many details and a number of illustrations of the principal features of the building. It has now been completed, and the dedicatory exercises are to take place next week, according to a programme which was published in *The Iron Age for* April 4. We now present, through the courtesy of T. C. Martin of the Programme Committee, additional facts which practically complete the story of the union building, provided through the munificence of Andrew Carnegie, for the occupancy of the American Society of Mechanical Engineers, American Institute of Mining Engineers, American Institute of Electrical Engineers and Engineers' Club. Mr. Carnegie donated $1,500,000 to be expended in the construction of a building, the bodies interested buying the land.

The site acquired for the Engineering Societies' Building is on West Thirty-ninth street, north side, between Fifth and Sixth avenues. The frontage covers five city lots, Nos. 29 to 33, the total front being 125 ft. This land has been bought with money advanced by Mr. Carnegie through R. A. Franks to the three engineering societies at 4 per cent. interest, the cost being $502,000, one-third of the amount being payable by each society. To the east of the property, light and air for the building are satisfactorily insured by the purchase by the Engineers' Club for its own protection of a large four-story private house of "restricted" hight, the club being in the immediate rear of the Engineering Building.



Main Doorway of the Engineering Societies Building, New York.

The Joint Conference Committee.

Each of the bodies named in the gift of $1,500,000 from Mr. Carnegie appointed three of its members to form a joint Conference Committee of 12, whose duty it should be to accept the gift and erect the buildings, and that committee has remained in active existence up to the moment of the dedication of the Engineering Societies' Building. It comprised the following:

American Society of Mechanical Engineers: C. W. Hunt, J. M. Dodge, F. R. Hutton; American Institute of Mining Engineers: A. R. Ledoux, C. Kirchhoff, T. Dwight; American Institute of Electrical Engineers: C. F. Scott, C. W. Rice, T. C. Martin; Engineers' Club: W. H. Fletcher, J. C. Kafer, W. A. Redding. In organizing for its work this body made Mr. Scott chairman, Professor Hutton secretary and Mr. Kafer treasurer. Various changes occurred in the personnel of the committee from time to time. Dr. Ledoux was succeeded by E. E. Olcott. Messrs. Rice and Martin were succeeded by Dr. S. S. Wheeler and Bion J. Arnold, and later Dr. Wheeler gave place to John W. Lieb, Jr. Mr. Martin succeeded Mr. Redding. Mr. Kafer, on his death in 1906, was succeeded by Mr. Kirchhoff as treasurer.

One of the most important duties of the committee was the division of the gift in proportion to the require-

ments and objects of the two buildings. The delicate task was accomplished by allotting $1,050,000 to the Engineering Societies' Building and $450,000 to the Club Building. While the nine representatives of the technical bodies and the three of the club devoted attention to their specific buildings throughout the three years of constructive work, there were a great many questions that required the constant consideration of the Conference Committee as a whole.

Competitive designs for the building were submitted by a number of architects, among whom the successful contestants were Herbert D. Hale of Boston and Henry G. Morse of New York, associate, who were forthwith appointed the architects for the building and who as the firm of Hale & Rogers, and H. G. Morse, associate, carried out the work. The award for the clubhouse was similarly made by the Conference Committee to Whitfield & King, New York.

The Holding Corporation.

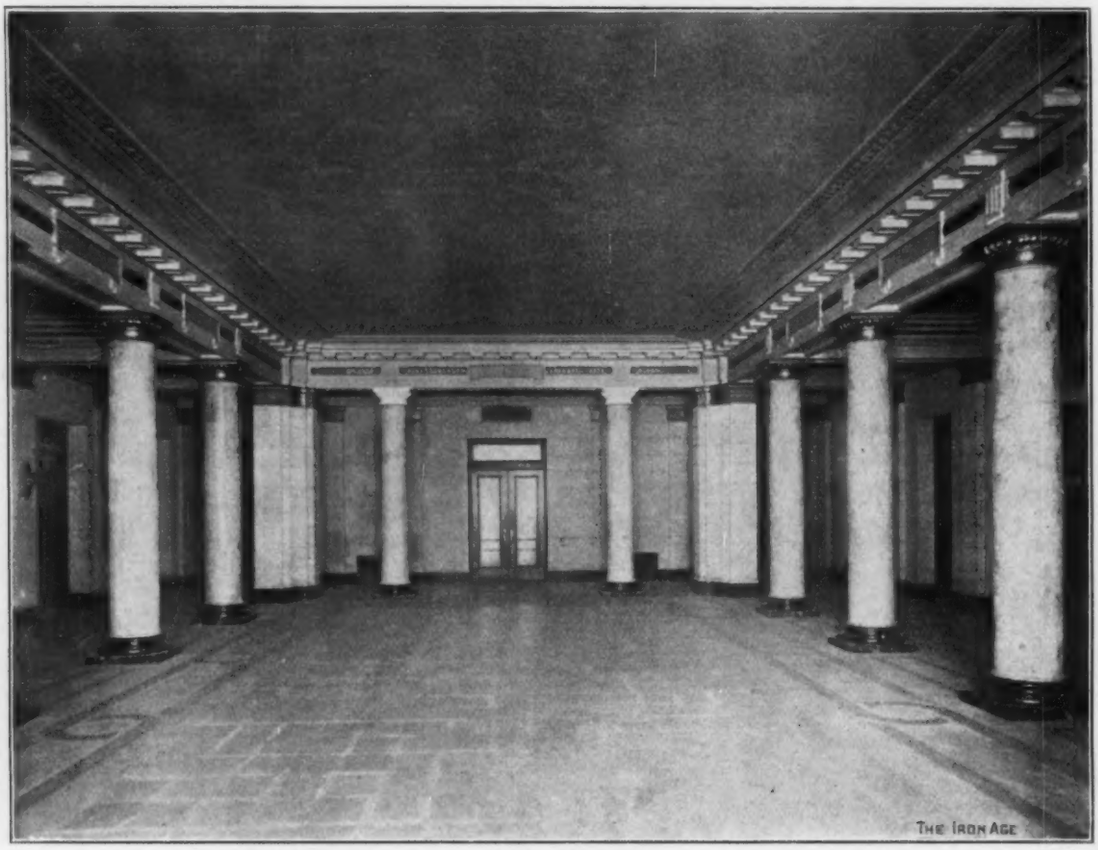
Prior to undertaking the work in connection with the Engineering Societies Building, it was found necessary to organize a holding corporation to administer the endowment and property for the founder societies jointly and in common; and the novel conditions attending the acceptance and utilization of the gift raised many legal and economic problems as to the mutual relationships, duties and rights of the recipients. A corporation was formed by special charter in the State of New York, in May, 1904, called the United Engineering Society, to act as the trustee for the three founder societies, and its nine trustees are chosen periodically three each by the councils of the Electrical, Mechanical and Mining Engineers, to control the building and regulate its finances. The title of the land rests also in this body corporate.

The first president of the United Engineering Society was Dr. A. R. Ledoux, who was succeeded by the present incumbent of the office, E. E. Olcott. While the charter and by-laws of the society have been framed to protect the interests of the three "founder societies," under the gift, careful provision is made also for the welfare of the "associate societies," *i. e.*, the numerous other technical bodies occupying the building as their headquarters.

The contract for the construction of the building was executed with Wells Brothers Company on July 17, 1905. The cornerstone of the building was laid in the eastern wall by Mrs. Andrew Carnegie on May 8, 1906. The time of completion was fixed for November 15, 1906. Offices were ready for occupancy on December 15, 1906; some were in use before the end of the year, and the entire building, though not quite finished, was ready for use January 1, 1907. This remarkable expedition was largely due to the fact that at no time did the architectural plans require important revision. A steel strike in the spring of 1906 lasted one month and a plaster strike in November about two weeks, but the building was erected within the specified time and within the appropriated sum.

Dimensions and General Plan.

The frontage of the Engineering Societies Building on West Thirty-ninth street is 115 ft. and the depth is 90 ft. The property itself is 125 ft. front by 110 ft. depth. The building laws of the city of New York require that only 85 per cent. of the lot area shall be occupied by the structure on it. Advantage has been taken of this limitation to give the building a monumental appearance.



First Floor Entrance Hall, or Foyer, of the Engineering Societies Building, New York.

It is designed in the French style and rises 13½ stories above the sidewalk to a hight of 218 ft. 6½ in. The exterior is built of limestone up to the auditorium floor, and of gray mottled brick and terra cotta above; the whole having a cheerful cream tint on all four sides. As the lower portion is devoted to auditoriums, the middle section to offices, and the upper part to the library, an effort has been made to accentuate these three separate parts of the building, with happy result.

In excavating the foundations, rock was found at from 27 to 67 ft. below the curb line, and there are 46 concrete piers in the foundation going down to solid rock. Two of these piers sustain a load of 3,000,000 lb. each in weight of structure alone, and the steel columns at these two points weigh 1000 lb. to the foot. The steel plate girders in the ceilings of the main auditorium weigh 48 tons each, and the steel lattice truss on the sixth floor weighs 64 tons. The total weight of steel employed in building construction is 2650 tons.

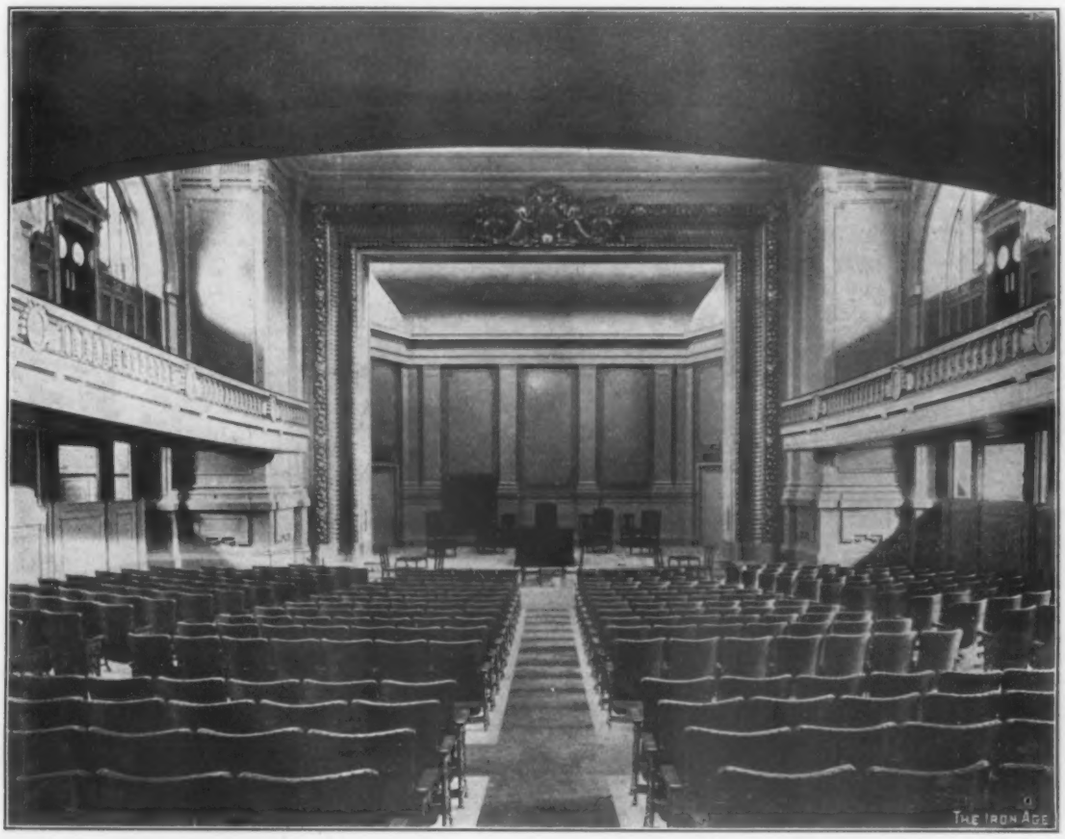
All the steelwork in the building has been covered with from 2 to 4 in. of semiporous terra cotta, and the columns are grouted with concrete. The floors are built

with terra cotta 6 in. segmental arch construction, overlaid with 5 in. of cinder concrete. All exterior walls are furred with 2-in. terra cotta block, to prevent any possibility of moisture being driven through the walls.

Access to the building is gained by the central entrance on the street level to the first floor, by the western side door leading to the elevators, and by the broad driveway which encircles it completely, so that carriages can enter by the eastern covered arch, set down their occupants at a side entrance and emerge by the western gate. There are three elevator riseways in the main elevator shaft, faced with an iron grill lined with wire glass. On each side of this shaft wide stairways rise to the sixth floor of the building, and one leads thence to the library floor. A freight elevator has been installed on the eastern side of the building, and a commodious service stairway on the north side rises the entire hight of the edifice. At the first floor, a rear door communicates across the 10-ft. areaway, in the open, with the café of the clubhouse, and on the ninth floor a flying covered bridge connects with the breakfast room on the tenth floor of the clubhouse.

placing an 8000-gal. tank on the roof, with a stand pipe at each end of the building, the tank being fed by two electric pumps.

All the walls and ceilings are painted in neutral tints, and the decoration is simple, though carefully studied, especially with an idea to later development in the way of mural paintings, the setting of the names of distinguished engineers in plaques, niches for bronze or marble busts, panels for bronze tablets, &c. Opposite the elevator shaft on each of the three founder societies floors the badge of the society occupying the floor has been executed in a heavy brass plate set into the terrazzo. The hardware throughout is in a subdued brass finish, is quite massive and is master keyed for all doors. The mail chute is ornamental and of the latest pattern. The driveway is defended by handsome wrought iron gates specially designed, and over the main entrance a large bronze plaque has been set, bearing the words: "Engineering Societies," to explain the purpose of the building to passers-by.



Main Auditorium of the Engineering Societies Building, New York, Looking Toward the Stage.

The Interior Finish.

The woodwork in the building has been reduced to a minimum. The large windows are built of cast iron, and the other windows of wood covered with kalamined iron, such windows having only a small molding in place of the usual wide trim and casing. All the doors in the basement, first floor and at the ends of the auditorium promenade are kalamined iron fire doors, and the exit door to the Engineers' Club is built of electroplated copper on wood. All the woodwork, including floors, sleepers, trim, &c., has been fireproofed. The windows up to the hight of 100 ft. are glazed with wire glass, except on the Thirty-ninth street front, thus bringing the exterior fire hazard down to the lowest possible point. All finished floors throughout the building are of cement, marble or terrazzo, except the library, main auditorium and lecture rooms, where maple has been used. The insurance rate of 15 cents for this building is the best proof of its safe construction and solid workmanship. Moreover, additional precaution against fire has been taken by

The Power and Heating Plant.

The basement is occupied in part by the boiler room, 22 ft. below the curb, and the engine room 16 ft. There is also ample coal storage on the north side, and storage facilities for the various societies, chiefly owing to the fact that it was decided inadvisable to install an isolated light and power plant. All electrical energy is taken from the mains of the New York Edison Company. The entire basement and boiler room up to the level of the curb have been made thoroughly waterproof, and a sump pit has been installed to avoid any danger from extreme pressure. An ash hoist empties into the driveway.

Steam is employed for heating and ventilating purposes, generated at low pressure by three boilers of the wrought steel header type, of Babcock & Wilcox manufacture, having an aggregate of 5226 sq. ft. heating surface. The boilers, as well as the valves, piping and attachments in connection with the boiler plant, are designed and arranged for high pressure steam, should it at a later date be desired to install an electric generating plant.

The heating of the building is accomplished by low pressure steam circulating through radiators placed

underneath the windows. This represents not only the most economical method of heating, but it is the most effective means of counteracting the down draft from the windows. The radiators in the entire building are controlled automatically by the Johnson system of heat regulation. No blowers or mechanical means are required for heating the rooms. The extensive blower system installed is for ventilation solely. The ventilation is independent of the heating system, for while in the winter months the building must be heated 24 hr. per day, the ventilating system is required only when the halls and rooms are occupied. This separation of heating and ventilating apparatus is, therefore, fraught with economy and simplicity of operation. The Paul vacuum system of steam circulation is utilized in connection with the direct heating, with the tempering coils and with the air moistening apparatus.

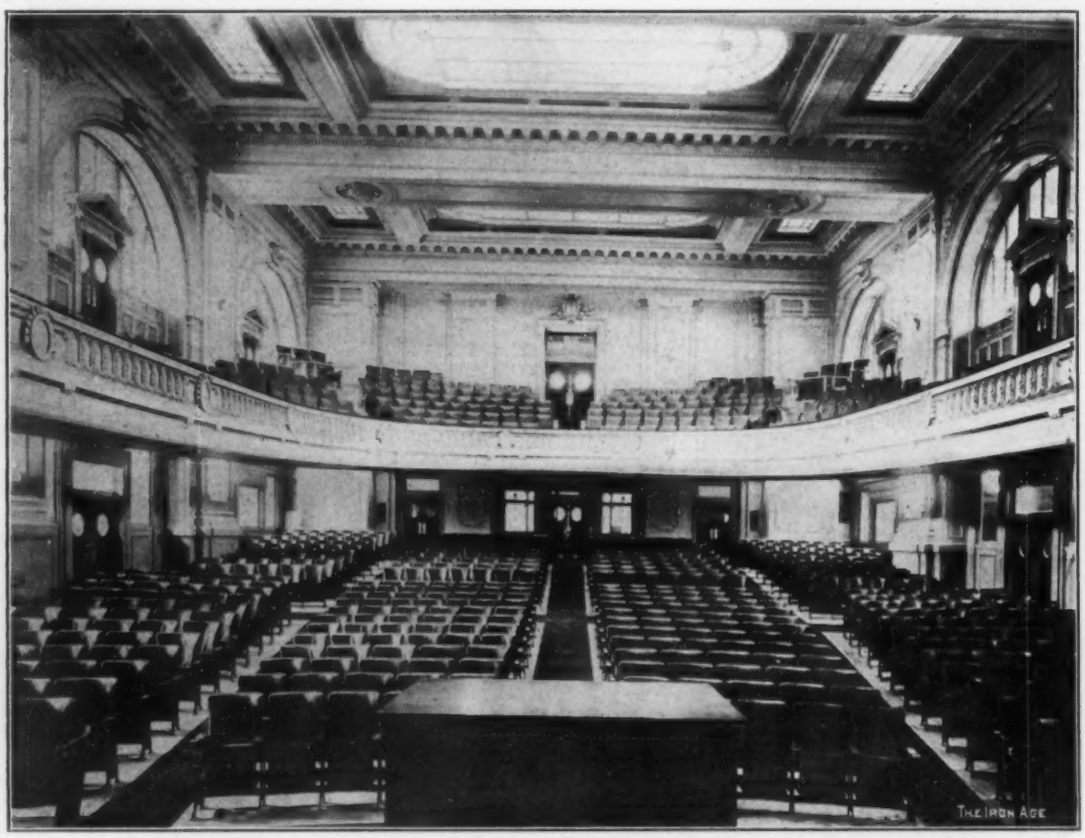
Ventilating Plant, Acoustics and Plumbing.

A thoroughly modern and effective ventilating apparatus is provided for the lower six floors, which contain the large assembly rooms. Pure, fresh air in large quantities is supplied to all the rooms and the main corridors in the lower six floors by means of four electric driven Sturtevant blowers located in the basement. Air is exhausted from these floors and from the basement, as well as from the toilet rooms throughout the building, by means of four electric driven Blackman exhaust fans located in fan houses on the roof. C. and C. electric motors are installed for driving the blowers and exhaust fans.

One hundred thousand cubic feet of fresh air per minute represents the total air supply, when the blowers are all operated at the same time. The fresh air after it has passed through the air inlet to the large chamber in the basement is drawn through the air filters, which free it from dust and the finer mechanical impurities. After the air has been filtered it passes over tempering coils and moistening pans, and is warmed and moistened in the winter months. It goes thence through the blowers, and by means of the galvanized iron duct system located in the basement to the vertical flues, entering the rooms through registers in the walls and ceilings.

The quantity of air supplied to the individual rooms varies, of course, with the special uses, but in every case a sufficiently large air supply is secured to keep the air pure. Special and unique features were adopted in the building construction so as to introduce the air into and exhaust it from the rooms by a great number of registers, so that a large volume is introduced at a low velocity and thus a perfect air distribution is secured. The heating and ventilating plant was installed from the plans and specifications and under the supervision of Alfred R. Wolff, consulting engineer. It should be noted also that the plans of the halls were submitted to Prof. W. C. Sabine of Howard University, as expert on acoustics.

The plumbing has all been installed upon the most modern principles of sanitation. All toilet rooms are in marble, and substantial wash bowls are installed in the majority of the office rooms. The fixtures are of the best and simplest type. All risers and waste water lines are brought up from the basement in two divisions at each end of the building and branch off at each floor, making it a very simple matter to add new risers and fixtures if needed. All the water is filtered.



Main Auditorium of the Engineering Societies Building, New York, Looking from the Stage.

The Electrical System.

As in the case of the other departments of the building the electrical equipment and the illumination had to fulfill unusual and peculiar requirements. The electrical current supply is derived from an outside street main service introduced into the building from the New York Edison Company and the United Electric Light & Power Company, so that both alternating and direct current are available. Space has been provided and the steam and electric equipment have been designed so that an electric generating plant may be installed at any time.

The feeders and mains for the lighting system are arranged on the three-wire system and the two-wire system for power. In all cases all of the wires of a given circuit are installed in the same conduit, so as to permit alternating current to be used on any circuit in the building. As the building is to be used by different societies it was essential that the feeder system should be arranged so as to provide means for measuring the cur-

rent consumption separately in different portions of the building.

Two separate feeders from the New York Edison Company have been introduced into the building, so as to afford additional security in case of failure of one of the service mains. Two separate feeders are also provided for the lighting of the main auditorium connecting at a switchboard with the two independent service street feeders. A flexible and convenient system provides abundant opportunity for reducing to a minimum the current consumption required for the hall and corridor lighting.

Inasmuch as it was impossible at the time the building was constructed to plan definitely the arrangement of the various society offices, and, consequently, the lighting thereof, it was deemed essential to provide such a flexible system as to permit lights for desks, &c., to be added as required later. For this purpose, in each office a circuit is run to a corner in the ceiling in each room, and from this point a square of molding is placed 18 in. from the wall and symmetrically aligning with the room parallelogram. At any point on this molding a small rosette may be inserted and an attachment for a drop light provided.

In order to provide ample current facilities for demonstration purposes, lectures, &c., special feeders have been run from the switchboard in the basement to the auditorium and to each of the assembly and lecture rooms. In addition to the special feeders, empty conduits are run to the auditorium and lecture and assembly rooms, so as to afford raceways for any purpose for which the special feeders would not provide. In the case of the auditorium, two 3-in. conduits run to and terminate in a cabinet at the back of the stage. In the case of the assembly and lecture rooms a single conduit of 2½ in. internal diameter has been provided.

A complete and flexible interconnection system has been provided for the building, having its main center in the basement. It affords means for connecting telephones or call circuits in practically every office in the building. In order to avoid running wires around the picture molding or along the baseboard in the offices, a system was devised by the electrical engineers of having a portion of the base removable, with ample space in the form of a channel extending completely around the room. In order to make this channel continuous, conduits are run under the doors, connecting with the channel space at either side of the door. This channel is connected by means of a conduit, with the nearest interconnection box on the floor.

The Illumination.

Complete specifications were prepared and sketches made by the consulting engineers, acting in co-operation with the architect, for the illumination of every room, and for every fixture in the building. It was realized by the engineers that the illumination was necessarily only one feature of the building and must be subordinate to, and in harmony with, the architectural features.

The central space in the entrance hall or foyer is lighted by means of individual lamps, placed in recesses, and concealed by panes of ground glass in the ceiling, at the sides of the rectangle formed by the columns around the large central area. In addition to this, larger crystal balls are provided in the outer corridor beyond the central space and in the elevator hall, entrances, &c. Crystal glass balls, holding "metallized filament" lamps of various sizes from 50 to 250 watts, are used on the principal floors, from the first to fourth, inclusive. In some cases, pagoda reflectors are used inside the balls to increase the effective illumination, and to reduce the current consumption.

The Library of the Engineering Societies Building, New York.

In the halls above the fourth floor, glass globes have been provided to screen the lamps. These globes, made according to the specification of the electrical engineers, are unusual in the fact that the intrinsic brilliancy of the lamp is reduced without an excessive loss in the efficiency, and at the same time a warm, pleasing opal glow is produced.

The lighting of the auditorium is the most effective, and probably the most interesting feature of illumination in the building. The result was obtained by the complete co-operation of the electrical engineers with the architects. At the engineers' suggestion the architects provided a space of about 15 in. between the ceiling of the

auditorium and the beams of the floor above. At the suggestion of the engineers, also, a glass septum was substituted in place of the proposed plaster panels in the ceiling. The details were then carefully worked out as to obtaining access to the lamps for renewal, and tests were made by the engineers to find a glass that would reduce the intrinsic brilliancy or glare, and at the same time would not have an amount of absorption prohibitive on the score of economy. The result obtained has been very satisfactory, and it is possible to sit through an entire lecture without being disturbed or distracted by the lighting. The general effect is both soft and pleasing, and resembles or suggests sunlight passing through glass, as at Napoleon's Tomb in the Invalides, in Paris. As a matter of fact, the solid arches of the floor above are within 2 or 3 ft. of the glass through which the light passes. Additional lighting screened by the same kind of glass is provided at the rear and at the sides under the balcony. Dimmers are provided for reducing the amount of illumination in the auditorium to any desired point, and also for the purpose of gradually increasing the lights to the maximum, after the room has been darkened for a stereopticon, thereby avoiding the unpleasant sensation produced on the retina of the eye, by flooding the room with light immediately following comparative darkness.

The lighting of the assembly and lecture rooms was also designed to prevent the lights from being distracting or unduly noticeable. For this reason, the cove method was adopted, with additional outlets in the ceiling for supplemental fixture lighting. The general illumination of the library is obtained by means of lamps placed above the glass ceiling skylight on a plan similar to that used in the auditorium. In addition, ceiling outlets are provided for general illumination, so that the indirect lighting above the glass need be used only at certain times.

The Elevators.

There are two Otis passenger elevators, 3100 lb. maximum load, speed 325 ft. per min. with 2500 lb. load. One elevator travels from basement gallery to the fourteenth floor, about 207 ft., and one from the first to the fourteenth, about 196 ft. These are of the latest type electric drum machines, being equipped with double screws, compound momentum brakes, automatic stop motion switches mounted on the drum shafts for limiting the car travel at either end, hoistway limit switches, slack cable switches and emergency brakes.

The cars are carried in steel slings or girdles which are fitted with the improved wedge clamp safety device which operates in connection with an Otis governor. This safety device is so constructed as to be made to grip the guides if a car is descending at undue speed. Each car is counterbalanced with very nearly its own weight, and to the back of each drum is attached a separate weight equal to the average load carried in the car. This arrangement of counterbalance gives the most economical results in current consumption.

The elevators are equipped with six ¾-in. Standard iron hoisting cables each; two being for lifting, two for car counterbalance and two for back drum counterbalance. The weight of these cables is compensated by chains attached to the bottom of each car sling and anchored midway up the shaft. In addition to the wedge safeties above referred to these elevators are squipped with the security retarding safety, which acts independently of the other safeties.

The elevators are controlled by means of hand operating switches conveniently located in the cars, and in case of accident the current supply to the machine and operating switch can be entirely cut off by the operator, and the emergency brake applied by opening a small switch, known as the safety switch, which is located near the car operating switch above referred to.

The freight elevator, which travels from the basement to the fourteenth floor at the rear of the building, has a maximum lifting capacity of 3000 lb.; speed with a load of 2500 lb. is 250 ft. per min. This machine, which is also a lifter of safes, is provided with a back gear attachment that can be readily connected or disconnected by the engineer, by means of which the machine can be made to lift 5000 lb. at a low rate of speed.

A locking device is also provided for holding the car securely at any floor level while loading or unloading. In all other respects this elevator is similar to the passenger elevators. The plant is operated on the 110-volt direct current circuit.

The Telephone Equipment.

Realizing that in a building of this nature the most up to date engineering ideas would be embodied in every feature of construction and administration, a careful study was made of the needs of the founder societies and the other tenants in the building, with respect to the telephone service, in order that the plant might be adequate and the telephone service thoroughly efficient. Such a study indicated that the most convenient and flexible as well as the most economical service could be effected by arranging for one switchboard for the entire service throughout the building, from which all of the trunk lines to the central office of the telephone company should extend, and in which all the extension telephones in the building should terminate.

Accordingly, a specially designed single-position switchboard to include all the most modern features, and finished to harmonize with the architecture of the building, has been installed. At the present time the switchboard is connected to the Bryant central office of the telephone company by means of seven lines, which may be used for incoming and outgoing traffic; and there are 38 extension telephones connected to this board and located throughout the building. The switchboard has an ultimate capacity of 15 central office lines and 60 extension telephones. This gives the building a flexible telephone service, since from any telephone at any point in the building communication may be had with any other telephone in the building or with any local, suburban or long distance point through the lines of the New York Telephone Company and its sister telephone companies.

Telephones have been installed in the offices of the three founder societies, and, in addition, in the engine room, service halls, coatrooms, library, the stackrooms, at the demonstrating tables, to be used by the lecturers, in the janitor's quarters, and at all points of activity, in order that it may be possible to send or receive telephone messages at any point in the building.

It is estimated that about 12,000 messages per year will be originated from the telephones in this building, and the contract to cover this number of messages has been arranged for. In addition to the telephones throughout the building, three booths have been installed on the ground floor, in order that visitors to the building or tenants may send messages from this point.

The First Floor.

The spacious first floor is laid with Tennessee marble tile, having a border in design of colored marble. The central court or main foyer is marked by 12 large columns of Swiss Cipolin marble. A short low flight of steps leads from the foyer to the elevators, and at will a metal grille is thrown across the steps so as to restrict or direct travel. Gold ornament is used sparingly for architectural accentuation, and the woodwork is in dark oak. Large chairs and lounges in red leather furnish the foyer, and similar furniture is used in the writing room, smoking room, reception room and administration room; which also contains three telephone booths associated with the "private exchange" system. On the foyer walls, facing toward the main entrance, are two large bronze tablets, one bearing a relief portrait of Mr. Carnegie and the words of his second terse letter of gift of $1,500,000, and the other a statement to the effect that the land was given by members and friends of the three founder societies. On this floor also, at the rear, are receiving and shipping offices through which all freight and goods are handled. In time this floor will be graced with statuary, but even now it creates a most favorable impression as one enters the building.

The Main Auditorium.

Immediately above the first floor is the coatroom, laid out on a sectional plan, so that several lines of persons may be accommodated at once on entering or leaving. Special toilet facilities are also provided on this

floor, which virtually occupies the space that would otherwise be left blank by the slope of the main auditorium floor just above it.

The main auditorium extends up through two floors, and with its gallery will seat about 1000 persons. The requirements of this chamber were unusual and difficult of definition. It had to be arranged primarily for the general meeting of the societies, at which the speaking is from the floor as well as from the platform, and at which diagrams, illustrations or blackboard drawings are often employed. This is quite the opposite from the ordinary audience hall, where the stage is the starting point both for the seating arrangements and for the acoustic and optical necessities. Hence the platform is notably small for so large a hall, accommodating few persons, while any speaker in the audience is easily within range of observation by everybody.

On both the parterre and the gallery floor, at the sides, the auditorium is surrounded by corridors, rendering access to every point very easy, and permitting ready withdrawal for conversation, committees, &c. The corridors assist also in maintaining quiet within the hall. The platform has ante rooms and is conveniently close to the freight elevator, for delivery of apparatus. There is also a fine stereopticon, equipped with connections for moving pictures. The seats are fixed opera chairs in red leather, with revolvable tops, and the aisles are laid with red carpet. The gallery front is bordered in red plush. Above the auditorium arch is a decorative cartouche bearing the badges of the three founder societies. The elevators and stairs open directly upon the two floors of the auditorium, which can thus be emptied very quickly in case of emergency. Practical tests of the chamber have already shown it to be a success in every respect of comfort and convenience.

The Lecture Rooms and Office Floors.

The next two floors above the main auditorium are devoted entirely to lecture rooms, of which there are no fewer than seven. Two spacious assembly rooms, 51 x 66 ft. and 29 x 66 ft., occupy the larger part of the fifth floor in such a manner that they can be used independently, or one may be made auxiliary to the other. Two smaller rooms on this floor, 16 x 22 ft. and 18 x 19 ft., can be also used separately or as annexes for reception or conversazione purposes, and provision is made with steam tables, &c., for the service necessary for luncheons or light refreshments. All these rooms are agreeably finished in soft light tints, and have facilities for water, air, electric connections, &c., for demonstrations and experiments.

The sixth floor is also divided into lecture rooms, planned somewhat differently, and of smaller dimensions than those on the floor below. The dimensions are, respectively, 22 x 44 ft. 6 in., 30 x 46 ft. 6 in., 30 x 41 ft. and 20 x 28 ft. In this manner the building affords facilities to audiences of every size from 1000 down to 100, while on occasion every room can be occupied by sections and subdivisions of an engineering or scientific meeting, with independence and without interference.

The seventh and eighth floors of the building have been reserved for the associate societies that have engineering or some department of science as their principal object. For these organizations the building affords office areas of varying size, from one room up, with the common facilities of the lecture rooms, library and other accessories. Among these societies may be enumerated the Society of Naval Architects and Marine Engineers, the Society of Heating and Ventilating Engineers, the National Electric Light Association, the Society of Chemical Engineers, the New York Electrical Society, the Association of Edison Illuminating Companies, the American Street and Interurban Railway Association.

Each of the three founder societies occupies a floor laid out in accordance with its own plans. The American Institute of Mining Engineers has the ninth floor, the American Institute of Electrical Engineers has the tenth floor, and the American Society of Mechanical Engineers has the eleventh floor. These floors are all devoted to administrative and executive work, and the libraries of the three societies have been concentrated in the two top floors of the building.

The Library.

A crowning detail in the plan of the building has been the reservation of the twelfth and thirteenth floors for the libraries of the three founder societies, and of such other collections of engineering literature as may be added. The twelfth floor below the library proper has been devoted to the book stacks, but at the present time the main library is also equipped with one tier of stacks, with provision for a gallery tier later. The stackroom is partly equipped with stacks, and in the library a delivery desk, reading tables and chairs have been provided. Provision is being made for special research accommodation, working alcoves, photographic reproduction, drawing and similar library work.

A bronze bust of Mr. Carnegie, executed especially for the building by Mrs. E. Cadwalader Guild, a well-known sculptor, from sittings, and presented by the present and past officers of the founder societies, stands at the eastern end of the library, facing toward the main entrance from the elevators.

The Contractors and Subcontractors.

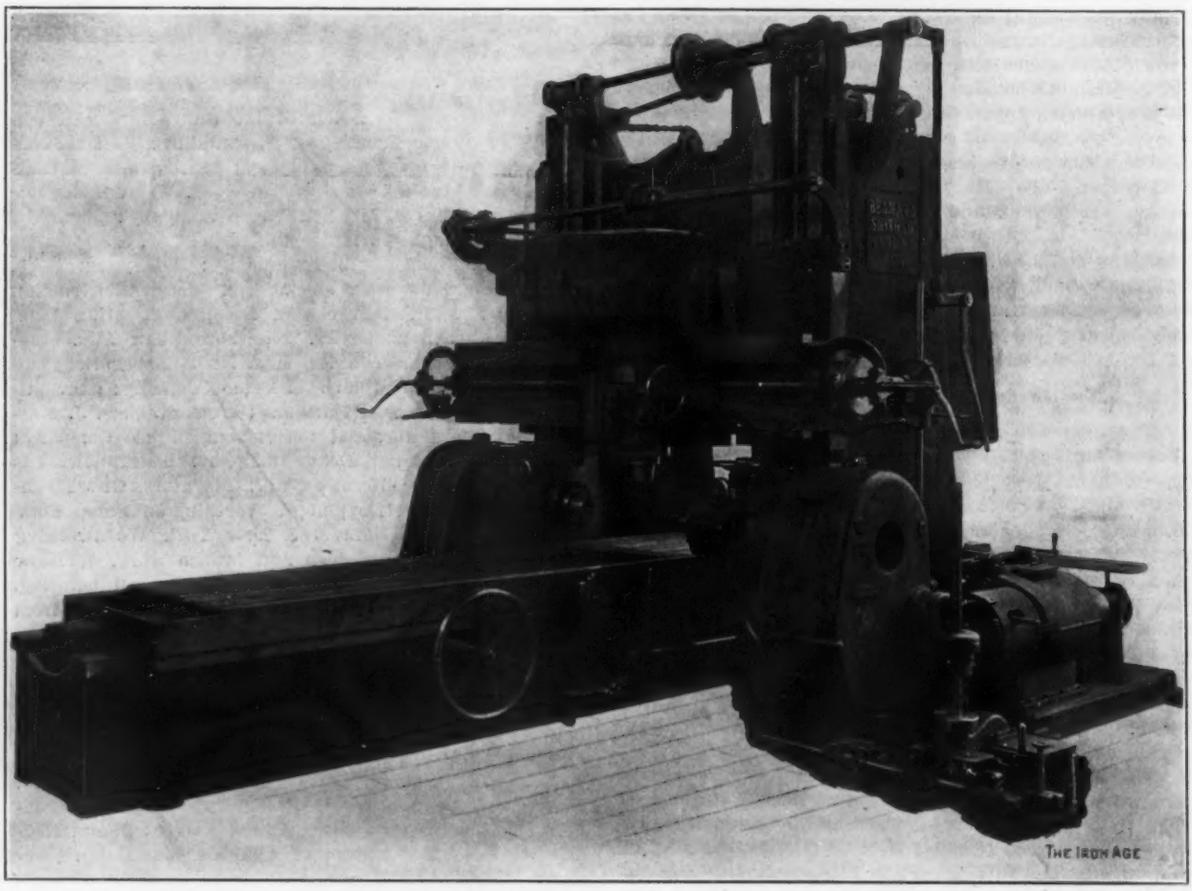
The following is a list of the contractors, &c., employed in the construction of the building: General contractor, Wells Brothers Company; heating and ventilating, G. A. Suter & Co.; electrical work, Western Electric Company; fixtures, Mitchell Vance Company; plumbing, James McCullagh; furniture and carpets, W. & J. Sloane; shades, Simpson-Crawford Company; library furniture, Library Bureau; book stacks, Art Metal Construction Company; auditorium chairs, American Seating Company; lecture room chairs, Readsboro Chair Mfg. Company; demonstration tables, L. E. Knott Apparatus Company; stereopticon, Charles Beseler Company; stereopticon screen, Journay & Burnham; bronze tablets, J. Massey Rhind, sculptor, and the Roman Bronze Company; steam table, Bramhall Deane Company. The following is a list of the subcontractors, &c.: Elevators, Otis Elevator Company; electric pumps, Worthington Pump Company; mill work, Batavia & New York Woodworking Company; ornamental iron and bronze work, Winslow Brothers Company; decorations and general painting, W. P. Nelson Company; special metal doors, Dahlstrom Door Company, New York Central Metal Company, Van Kannel Revolving Door Company; ornamental stucco work and plastering, McNulty Brothers; marble and mosaic work, Empire City Marble Company; ornamental brick, Fiske & Co.; granite work, Webb Pink Granite Company; tile wainscoting, Frank L. Davis; coffer and roofing work, James White Company; weather strips, Noiseless & Draughtless Door & Window Cushion Company; leather covered doors, Frank Fetzer; filters, Roberts Mfg. Company; fireproof windows, Manhattan Fireproof Door Company; fireproof doors, Howells & Lawrence; ornamental terra cotta, Conkling-Armstrong T. C. Company and R. Guastavina Company; window and door glass, Benjamin Griffen and Pittsburgh Plate Glass Company; metal lath and furring, A. Oliver & Co.; ornamantal stone work, James Gillies & Sons; parquet floors, J. B. Shaw & Co.; finishing hardware, Yale & Towne Mfg. Company; fireproof floors, National Fireproofing Company; plumbing fixtures, Henry Huber & Co.; mail chutes, Cutler Mfg. Company.

The longest distance the human voice has been transmitted is believed to be from Montreal to Winnipeg, 1430 miles, over a special copper wire along the line of the Canadian Pacific Railroad. This wire, which has intermediate connections only at North Bay and Fort William, was installed by the railroad company for its telegraphone system, by means of which two messages, one by telephone and the other by telegraph, can be transmitted simultaneously over the wire. A number of tests have been made of the new outfit, it being found quite easy to converse from end to end of the line, while at the same moment operators at an intermediate station (Fort William) were sending a telegraphic message to Montreal.

A Beaman & Smith Three-Spindle Milling Machine.

The betterment of tool steel has probably been of greater advantage to the milling machine than to any other machine tool, because the former carries more cutting points than almost any other type of machine. The benefit, however, has been felt by all classes of machine tools in that an increased output has been obtained without any appreciable increase in operating expense. A direct consequence has been the building of heavier and larger machines than were formerly thought necessary, of which the heavy milling machine illustrated and built by the Beaman & Smith Company, Providence, R. I., is an example.

This machine consists of bed, table, uprights, crosshead and box girder below the floor line, as the principal heavy parts on which the smaller parts are supported. The fast movement and feed of the table, the feed of the vertical spindle saddle, and, in fact, all important functions can be controlled from either side of the machine by suitable levers and connections, provided with proper locking or safety devices, insuring a correct sequence of lever movements to avoid an interference between operations. This is necessary, since all movements are effected through positive gearing and from a direct connected motor.



A Heavy Milling Machine with One Vertical and Two Horizontal Spindles, Built by the Beaman & Smith Company, Providence, R. I.

The general dimensions are as follows: The table has a 3 x 12 ft. working surface, is provided with six T-slots and four rows of stop pin holes, and is operated by the Sellers rack and screw movement. The bed is 31 in. wide over the table guides and is 21 ft. long. The uprights are 26 in. wide on the face, and are 10 ft. high. The distance between the uprights is 48 in. The distance between the ends of the horizontal spindles is 24 to 40 in. minimum and maximum. The adjustment of the vertical spindle is from 0 to 43 in. above the table, and it has a cross feed movement of 6 ft. The centers of the horizontal spindles may be placed on a line with the top of the table, or 34 in. above it. Each spindle has an 8-in. endwise fine adjustment, and is made with a taper end and a key to take large cutters and a No. 15 B. & S. taper hole, with drive slot across the end, to take taper shank arbors or mills. The crosshead is moved by power. The table and vertical spindle feeds range from 1 to 12 in. per minute at any spindle speed in either direction, with nine changes from the same feed box. The table has a fast movement of about 10 ft. per minute in either direction.

Each spindle has independent reverse, which enables the use of slab and face mills at the same time on different spindles, or each spindle drive can be connected or disconnected quickly by a locking lever, therefore when two or even one spindle only can be used to advantage the others can be disconnected. Each spindle head has four independent ratios of gearing—1, 2, 4 and 8—which are changed by positive clutches actuated by locking hand levers. This is not only an advantage in the increase of output, but it greatly relieves the driving shafts of torsion. If the spindles of a milling machine run only in unison, then the speed of the largest cutter limits the revolutions per minute of all the spindles, therefore the feed per minute is limited by the peripheral speed of the smallest cutter, necessarily reducing the output, which is self-evident. With this machine it is not only possible to use the same cutter right or left hand, slab or face type on any spindle, but cutters of one, two or three different diameters can be used simultaneously and each with approximately the same peripheral cutter speed. For instance, the following sizes can be used simultaneously at identical peripheral speeds:

1½, 3 and 6 in.	6, 12 and 24 in.
1½, 3 and 12 in.	or
1½, 6 and 12 in.	1½, 1½ and 3 in.
3, 6 and 12 in.	3, 6 and 6 in.
3, 6 and 24 in.	6, 12 and 12 in.
3, 12 and 24 in.	12, 24 and 24 in.

and any other 2 or 3 of the four ratios proportioned as combinations of 1, 2, 4 and 8. The importance of this possibility in a multiple spindle milling machine will be appreciated, as it enables the user to select cutters of suitable size for maximum production at minimum cost.

The vertical spindle center is located 11 in. in advance of the horizontal spindle centers. By this arrangement it is possible to finish a square corner, as a face mill on the vertical spindle, and one on the horizontal spindle can each lap by the corner of the piece being milled without interfering with each other.

The machine is driven by a 35-hp. 2 to 1 variable speed direct current motor controlled by a 20-point drum controller, which gives each spindle 80 changes of speed through ratios from motor to spindle of 13½, 27, 54 and 108 to 1, the speeds varying from 5½ to 90 rev. per min.

The weight of this machine, with motor complete, is about 50 tons.

Canadian Bounty for Electric Smelting.

TORONTO, April 6, 1907.—A resolution was introduced into the House of Commons by the Finance Minister on Thursday declaring it expedient to provide for the payment of bounties on pig iron and steel manufactured by electrical processes. The adoption of the resolution is, of course, not the same thing as the passage of an act on its third reading, but it is a practical certainty that the measure into which the resolution is to be turned will become law. Last week the opinion was hazarded in this correspondence that no special bounty for electrically produced pig iron or steel would be proposed by the Minister, and the bounties provided for in this resolution cannot well be described as special. They are simply an application and a time extension of the bounties now paid upon pig iron and steel produced by established methods. The terms of the resolution are as follows:

That it is expedient to provide that the Governor-in-Council may authorize the payment out of the consolidated revenue fund of the following bounties on pig iron and steel ingots manufactured in Canada for consumption therein, when such pig iron and steel is the product of Canadian iron ores smelted in Canada by electricity—viz., on pig iron manufactured from Canadian ore by the process of electricity smelting during the calendar years: 1909, $2.10 per ton; 1910, $2.10 per ton; 1911, $1.70 per ton; and 1912, 90 cents per ton. On steel ingots manufactured by electric process direct from Canadian ore, and on steel ingots manufactured by electric process from pig iron smelted in Canada by electricity from Canadian ore during the calendar years: 1909, $1.65 per ton; 1910, $1.65 per ton; 1911, $1.05 per ton; and 1912, 60 cents per ton.

It is apparently the intention of the Finance Minister to give the manufacturers by electrical processes a clear four-year period of bounty assistance of exactly the same kind as that now remaining for the blast furnace and steel works owners. For pig iron manufactured by the regular method from Canadian ore the bounties, it will be remembered, are to be as follows: In 1907, $2.10 per ton, 1908, $2.10; 1909, $1.70; 1910, 90 cents.

For steel ingots of which not less than 50 per cent. of the weight is derived from pig iron made in Canada, the bounties are as follows: In 1907, $1.65 per ton; 1908, $1.65; 1909, $1.05; 1910; 60 cents.

It will be seen that the new bounties on electrically produced iron and steel are to be at the same rate as those provided for iron and steel otherwise produced, the difference being that the four-year period for the electrical products does not begin until 1909, whereas that for iron and steel produced by the ordinary methods began on January 1 last. It is probably assumed by the Government that the intervening period of 20 months is not too long to allow for the establishing of electrical smelters and converters. But should any begin operations within that time their output would be entitled to the current bounties of $2.10 and $1.65, respectively, on pig iron and steel ingots, however produced.

Besides the results of experiments carried on with the aid and under the supervision of the Government at Sault Ste. Marie, laboratory work elsewhere appears to have successfully demonstrated the feasibility of treating some of the most unpromising of Canadian iron ores by electrical processes. It is stated that while the tests at Sault Ste. Marie were in progress private parties were proving the practicability of the electrical smelting of titaniferous ores in Quebec. These parties are reported to be in touch with New York and London capitalists.

R. Turnbull, a Scottish engineer, who was associated with the experiments at Sault Ste. Marie, proposes to erect a plant at Welland, in this Province. He undertakes, if adequate bounties are granted, to have his plant in operation a year from next July. N. Thompson, who went from Canada to England last year, succeeded in interesting capital to establish an electric smelting plant at Bow, near London. He is now back in Canada and proposes, if sufficient Government aid is given, to form a company for the electric smelting of iron ores in British Columbia.

C. A. C. J.

A New All-Steel Pulley.

A new design of an all-steel belt pulley manufactured by the American Pulley Company, Philadelphia, Pa., is herewith illustrated. This design is used in the larger sizes, particularly those of 44, 46 and 48 in. diameter, and differs materially from that used in the smaller sizes made by this company. The principal feature is in the number and arrangement of the arms, which have been increased from six to eight. The arms are made of wider metal and are secured to the rim flanges by three rivets for each arm. These pulleys are designed for great strength and have been tested severely. It will be seen

A New All-Steel Pulley, Manufactured by the American Pulley Company, Philadelphia, Pa.

that the arms widen as they approach the hub, and are bifurcated and corrugated to increase the stiffness, making a pulley of exceptional strength and lightness. Of course, in large pulleys particularly there is also a direct gain through lack of weight, both for transportation and in power required to drive the pulley, as well as in weight carried on the shafting. These pulleys are of the parting type.

The American Pulley Company, which is the pioneer in the making of all-steel belt pulleys, has lately completed important additions to its plant. In 1897 the entire output of the company was 18,000 pulleys from 6 to 24 in. in diameter, in 1906 the output was 200,000 pulleys from 6 to 42 in. in diameter. During the past year the factory has been equipped for making pulleys up to 48 in. in diameter and of 6 to 16 in. face, diameters and faces varying by 2 in., so that the total range of sizes which can now be had of this standard type of pulley is from 6 to 48 in. in. diameter and from 2 to 16 in. faces, according to diameters. The company has also developed a line of all-pressed metal sash pulleys, which are having marked success. By June 1 the factory will be producing 100 belt pulleys of miscellaneous sizes and four gross of sash pulleys per working hour.

O. S. Presbrey, successor of the Cheever Ore Bed Company, Port Henry, N. Y., is resurrecting the old Cheever mine. There has just been completed a cement and iron engine house, containing two 150-hp. boilers, an 80-hp. air compressor and a 100-hp. hoisting engine. This is to be followed by a magnetic plant with a capacity of 300 tons per day, to be completed by the middle of August.

A Stationary Centrifugal Gas Washer.

A stationary gas washer has been patented by F. E. Bachman, Port Henry, N. Y., manager of the Northern Iron Company. It cleans gas in the same way in which a Stratton steam separator removes water from steam. It consists essentially of a vertical cylinder, having its interior surface covered by a descending sheet of clean cold water. Into this cylinder a rapidly flowing current of dust laden gas is admitted and caused to flow in a helical path, due to its admission through a tangential inlet. The rotary motion of the gas throws the particles of solid matter by centrifugal action against and into the sheet of water at or near a right angle to its flow, and holds them there until they are wetted and carried away. The exceptional efficiency of the apparatus results from the dust which has once come in contact with the water being held there until it is wetted, instead of rebounding and being carried away with the gas as the lighter particles do in other surface washers when thrown against a sheet of still or slowly moving water; a further reason is that the dust strikes the rapidly flowing water, which is always free from scum, at a right angle to the water current. Who does not recall having failed to skip a pebble across a rapidly flowing stream?

This washer is the outgrowth of the centrifugal dust catcher designed by Jos. L. Hunter, Roanoke, Va., for the Crozer Furnace in 1888. A dust catcher of the same design installed at Pulaski Furnace was described in *The Iron Age* of February 28, 1907. The first washer embodying this principle was erected by the Northern Iron Company, Port Henry, N. Y., in 1904. Its inner surface was coated with water from perforated pipes inside the shell. A cast iron helix between the shell and the outlet forced the gas to follow a spiral path. A gas explosion broke the helix, after which it was removed without reducing the efficiency of the washer. The water openings in the spray pipes continually clogged, resulting in too little water being supplied to prevent steam from being formed, and the consequence was wet gas. This defect was overcome by the water feeding device shown. It was applied to the washer at the Northern Iron Company's Standish Furnace in 1905, and has been in successful operation since, with no cost for repairs or attention.

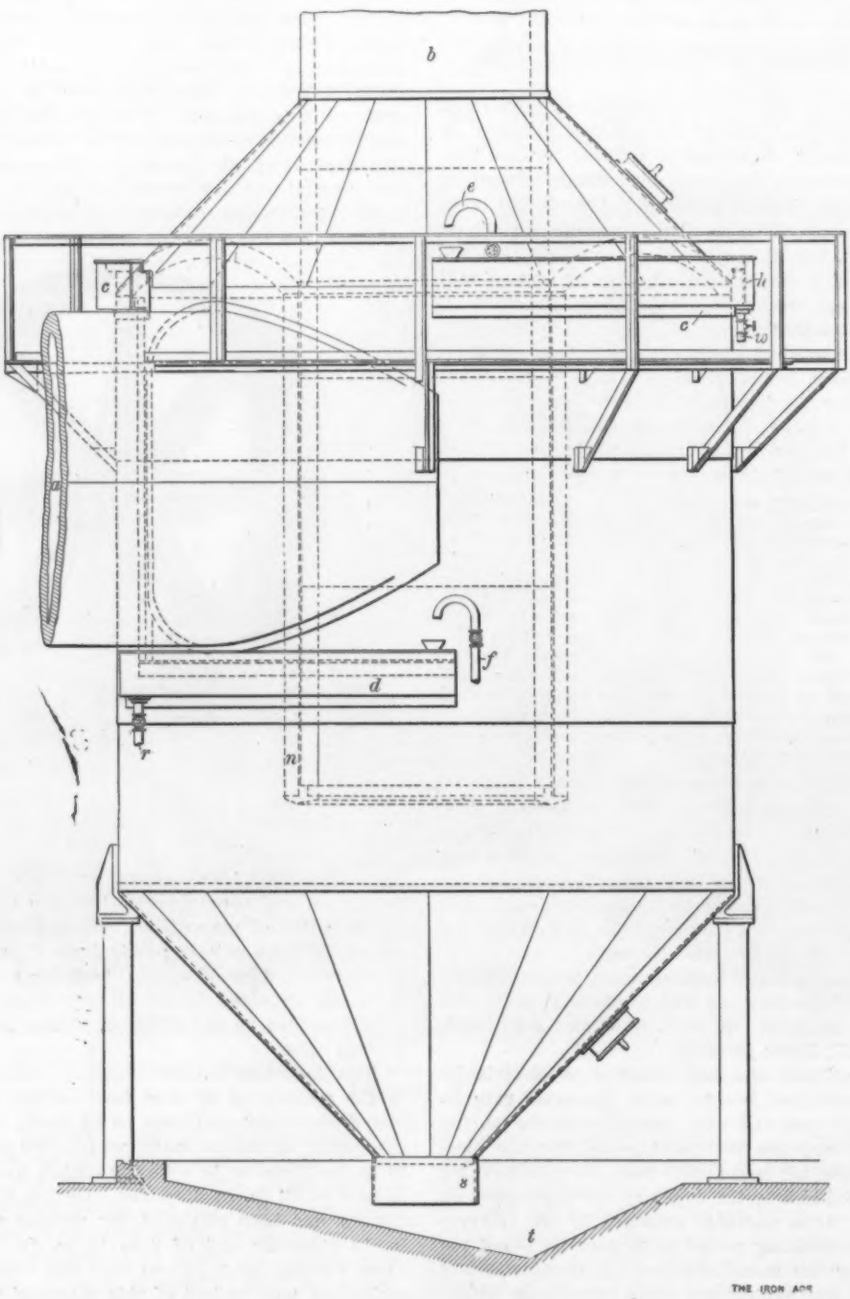


Fig. 1.—The Bachman Centrifugal Gas Washer.

Three illustrations are given. Fig. 1 is a side eleva-

tion of the apparatus. Figs. 2 and 3 are enlarged detail sections of the two water distributing boxes referred to below. In Fig. 1, *a* is the tangential gas inlet, and *b*, the uptake or outlet through which the gas passes away from the washer; *c* is the upper and *d* is the lower water distributing box. Water is supplied to these from the valved feed pipes *e* and *f*, entering the outer chamber *g*, and from which it passes under the aprons *h* and *i* into the inner chamber *k*, from which it enters the washer through the openings *l* and *m*; *n* and *o* show the brickwork protecting the portions of the structure not covered by water. On leaving the washer the water and dust pass through the cylindrical opening *s* into the water seal *t*. At *r* and *w* are washout pipes for cleaning any mud or sediment from the water distributing boxes.

The improved method of supplying water to the interior surface of the shell, by which wet gas is prevented

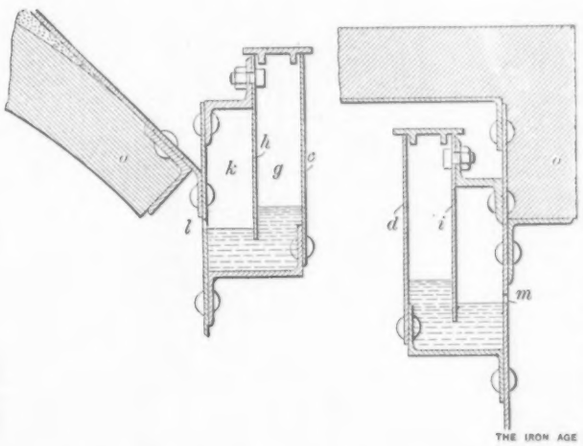


Fig. 2.—Section of Upper Water Distributing Box.

Fig. 3.—Section of Lower Water Distributing Box.

and a regular supply of water is assured, is by the use of the two water distributing boxes, which are simple water seals discharging into the washer through openings in the shell. The top one, extending about three-fourths the circumference of the washer, is divided into three compartments by transverse partitions, each of which has an independent gravity water supply and a valved washout pipe. The apron is made removable, to enable cleaning the openings for water admitted through the cylindrical shell without stopping operations. This precaution seems to be unnecessary, the openings never having clogged.

The lower box, placed under the intake, extends about one-third of the circumference of the shell; it is of the same construction as the upper one, excepting that it has no partitions. The openings for admitting water to the interior are ⅝ in. in diameter and 5-in. pitch. The head of water in the inlet section of the box exceeds the gas pressure just enough to cause it to rise to and flow through the inlet openings. On entering the cylinder the rotating current of the gas instantly distributes the water over its whole inner surface. The dust thrown from the gas cannot any more strike the shell than a bullet can enter water at an angle, therefore it cannot cut or injure it. All portions of the interior not covered with water are protected by brick linings. The dust taken up by the water is carried into the water seal at the bottom, from which it is washed by a portion of the tuyere water into a sewer or sump.

Results obtained from the use of this centrifugal washer are these: The combustion chambers of the stoves require cleaning but four times a year; the stoves have lost none of their efficiency after 28 months of use; very little dust is deposited under boilers, and that almost white. The total accumulation of dust in flues, under boilers and in stoves, is less than two carloads. The flue dirt handled in the same time was 12,318 tons. There is no appreciable loss in the heating efficiency of the gas, boiler and locomotive coal having cost $0.049 during 1905, and $0.048 during 1906 per ton of iron made. Some tests made showed the following results:

Test No.	Gas temperature. Entering.	Leaving.	Moisture increase. Per cu. ft.	Dust. Entering. Per cu. ft.	Leaving. Per cu. ft.
1	340° F.	280° F.	3.4 gr.	18.1 gr.	0.02 gr.
2	460° F.	380° F.	4.6 gr.	17.6 gr.	0.04 gr.
3	580° F.	490° F.	5.4 gr.	16.8 gr.	0.03 gr.
4	...	...	..	20.8 gr.	0.08 gr.
5	...	...	..	23.7 gr.	0.12 gr.

Samples were taken over a period of 30 min. Dust was determined by filtering through glass wool; moisture by condensation on glass wool and absorption by calcium chloride. Furnace was settling by jumps while No. 4 was being taken; slipped 4 ft. 6 in. while No. 5 was being taken.

Absolute accuracy is not claimed for the dust determinations, owing to the difficulty of getting correct samples. The washer is automatic and foolproof after the water supply valves are properly regulated and locked. An 18-ft. diameter washer will clean the gas from a furnace taking 50,000 ft. of air per minute. It will have about 1800 sq. ft. of effective water surface, and cost $3 to $3.50 per square foot of surface. The water required for this sized washer would be supplied by four 1½-in. feed pipes. If it is desired to cool the gas preliminary to cleaning for gas engines, the offtake can be enlarged and the ascending gas sprayed. The washer can be converted permanently into a Hunter centrifugal dust catcher by lining or temporarily by turning off the water and spraying the exterior of the shell.

The Lucas Tube Expander.

A new tool that will interest the boiler and locomotive builders and repairers is the Lucas sectional spring tube expander, which is being manufactured and sold by W. H. Dangel & Co., Chicago. The tool is the invention of A. D. Lucas, foreman boiler maker of the Burlington & Missouri River Railroad at Havelock, Neb., and has been tested and developed to make it a thoroughly practical tool.

The expander has the same general contour as the Prosser type of spring expanders, but the taper of the pin or mandrel is greater, decreasing its tendency to stick in the sections. The expander is operated by a small pneumatic hammer (No. 5 or 6) and does not require hard blows with a heavy maul, as is common with the usual types of expanders. The tool is easily handled, the 2-in. size being only 8 in. long over all, allowing the operator to be close to the work and enabling him, it is

The Lucas Sectional Spring Tube Expander, Made by W. H Dangel & Co., Chicago.

claimed, to expand four times as many flues with much less labor than a hand tool requires.

The expander works the flue readily in the sheet without working the sheet. The pin never sticks and the operator can turn the expander easily at any time. With the old style expander and maul the flue sheet is worked more or less and the holes stretched, due to the heavy pounding necessary. With the Lucas expander the flue can be nicely set up against the sheet and given the full contour of the expander, without affecting the sheet. As a consequence, it is stated that the life of the flue sheet will be longer, there will be fewer cracks between the bridges, and the holes will not elongate so rapidly.

On repair work the expander can be used to advantage and save considerable time over the old method, without damage to the flue sheet. The absence of the heavy pounding and the light quick blows of the air hammer are claimed to result in perfect work in a fraction of the time formerly required.

English cutlery interests in Sheffield and Liverpool are said to be investigating molybdenite finds near Temagami, Canada. A ton of the ore is to be shipped to England for experimental purposes.

The Gadsden Plant of the Southern Steel Company.

The completion of additional furnaces at the open hearth steel plant of the Southern Steel Company, at Gadsden, Ala., and the expenditure of considerable sums on improvements in other departments make timely a description of the Gadsden Works, which are the most extensive iron and steel operation in the South, apart from the immediate environs of Birmingham.

As has already been indicated in these columns the Southern Steel Company represents an expansion of the Alabama Steel & Wire Company, which first built rod and wire mills at Ensley, Ala., in 1899, adjoining the steel plant of the Tennessee Coal, Iron & Railroad Company, from which it obtained billets, and afterward at Gadsden, 60 miles northeast of Birmingham, erected a blast furnace and four open hearth steel furnaces. The Gadsden plant is in the midst of the ore, coal and limestone formations which stretch to the northeast and southwest, with Birmingham as a center. The blast furnace was started up in January, 1904, and the steel plant in June of that year. Eventually any extensions of the finishing capacity of the company in wire goods and wire nails will be made at the Gadsden plant. At present shipments of steel billets are made to the Ensley rod mill. Eventually, also, the blast furnace capacity at Gadsden will be increased, so that there will be a larger use of direct metal in the open hearth furnaces and less dependence on shipments from the Trussville, Ala., and the Chattanooga, Tenn., furnaces of the Southern Steel Company—the former being about 40 miles to the southwest and the latter about 80 miles northeast of Gadsden.

The Gadsden site was selected because of its proximity to raw materials, its good railroad connections, the healthfulness of the district, and its abundant supply of water from the Upper Coosa River. In this last respect the location has an advantage over Birmingham, which is now at work on the problem of increasing its water supply by connecting with the upper reaches of the Warrior River, 30 to 35 miles north of the city. The railroads furnishing Gadsden its outlet are the Alabama Great Southern, the Louisville & Nashville, the Chattanooga Southern, the Nashville, Chattanooga & St. Louis and the Southern Railway. The Alabama Steel & Wire Company acquired 250 acres for its operations there, having in mind important future extensions. As shown in Fig. 1, the plant thus far has been laid out on a liberal scale, the distance from the trestle over which raw materials are brought in at one end of the plant for depositing in the bins to the billet yard at the other end being more than ½ mile. The total length of railroad tracks in the company's yards is 6 miles. For the hauling of materials between departments the company has six locomotives.

Blast Furnace and Equipment.

The blast furnace is 90 ft. high, measured from the bottom of the hearth to the platform, with 20 ft. bosh diameter and 12 ft. 6 in. in diameter at the hearth. The mantel, which is of plate and beam construction, is car-

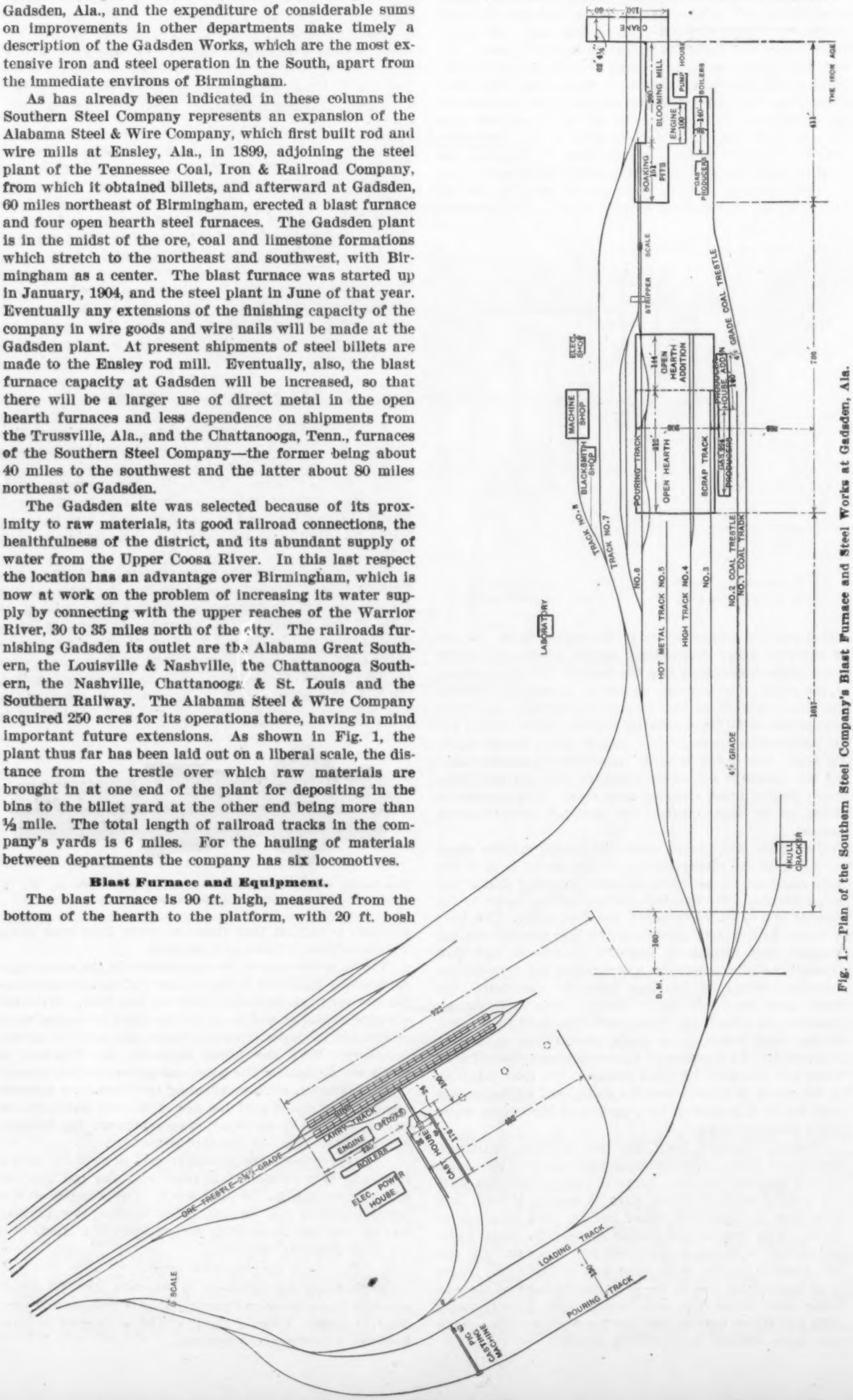


Fig. 1.—Plan of the Southern Steel Company's Blast Furnace and Steel Works at Gadsden, Ala.

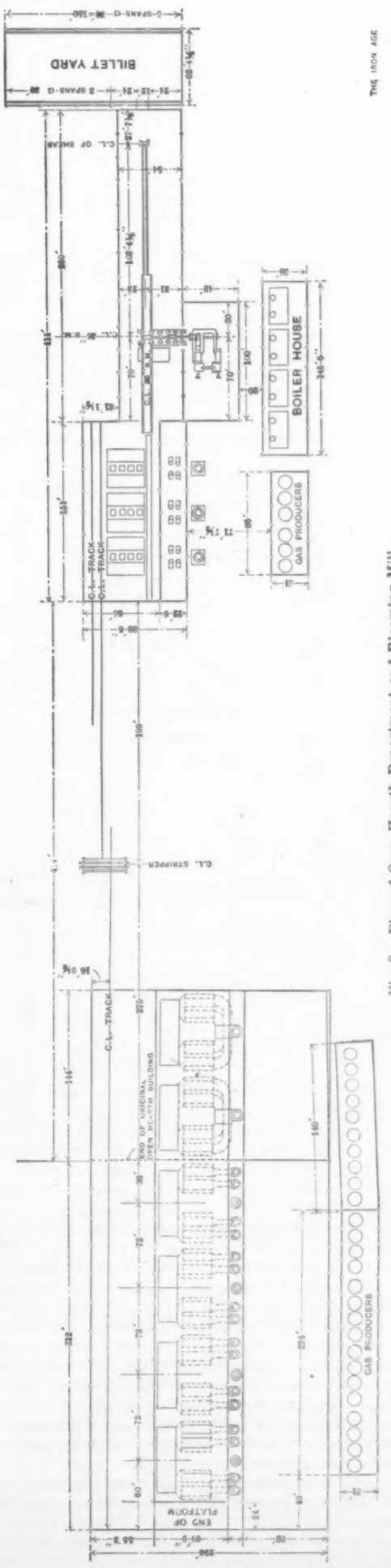


Fig. 2.—Plan of Open Hearth Department and Blooming Mill.

ried on eight 16 x 18 in. by 20-ft. cast iron columns. The hearth jacket is made up of horizontal fluted segments connected with straps and between the hearth jacket and the brickwork are vertical cooling pipes. A row of cast iron cooling plates is provided in eight segments above the tuyeres and one row at the mantel plate. The furnace is blown through 16 7-in. tuyeres. Top filling arrangements include a steel hoist incline traversed by a skip, a large bell 9 ft. 6 in. in diameter, a small bell 3 ft. 10 in. in diameter, with a cylinder for operating each and a McKee stock distributing device. The distributer is operated by an electric motor, which by means of a gear and pinion allows the hopper to discharge on any desired quarter, as shown by electric indicator. Four skiploads are thus deposited on the lower bell with each complete revolution of the top hopper. The device has now been installed at a number of Southern blast furnaces. The skip has a capacity of 168 cu. ft., and travels at the rate of 126 ft. in a minute. Two ⅞-in. hoist cables are used, wound on drums which are operated by a 12 x 12 in. direct geared Otis hoisting engine. The gas passes from the top of the furnace through a single downcomer of 6 ft. 9 in. inside diameter, and the dust catcher is 16 ft. 9 in. inside diameter. The gas mains are 6 ft. 9 in. inside diameter, with dust leg between the gas main and the connection to the boilers.

The four stoves are 20 x 90 ft., of the Whitwell two-pass type, with five 16-in. air valves, one 28-in. hot blast valve and one 48-in. chimney valve. The hot blast main is 48 in. in diameter and the cold blast main 30 in.

The blowing engine house contains four 42 x 84 x 60 in. vertical blowing engines built by the Southwark Foundry & Machine Company, Philadelphia, Pa., the fourth having been added recently. There was an original installation of nine Stirling boilers of 350 hp. each, fitted with the Parson steam blower system. Two additional boilers of the same type were recently installed. The pumping outfit for the blast furnace consists of two 14 x 8 x 12 in. McGowan feed water pumps; one 16 x 10½ x 18 in. pot valve Herron pump; one 20 x 8 x 18 in. Knowles pump, and two No. 12 Cameron pumps. The last named supply the bosh cooling water.

Water for the blast furnace and steel works is brought 1¼ miles from the Upper Coosa River and is pumped through a 20-in. main by two Worthington pumps with a capacity of 12,000,000 gal. in 24 hr. The pumps are direct connected to a motor furnished by the Elwell-Parker Electric Company, Cleveland, Ohio. The electric power house contains two Westinghouse 300-kw. three-phase generators, from which are taken at the same time voltages of 500 and 250. These supply electric power for all the needs of the blast furnace and steel works and accessory plant, including the machine shop.

Provision for Raw Materials.

The stock trestle over which ore, coke and limestone are brought to the furnace bin system is 850 ft. in length, and the tracks over the bins are 35 ft. above the larry car track level. There are 88 stock bins of timber construction, arranged in two parallel sections 538 ft. long, each bin having a capacity of 3000 cu. ft. The electric larries which convey the stock from the bins to the skip hoist run on the ground level. Additional trestles have been provided recently, so that storage capacity is afforded for 50,000 tons of ore and 15,000 tons of coke. The principal sources of ore supply now being drawn upon are the Crudup mines of the company, 7 miles northeast of Gadsden, yielding a 40 per cent. red ore, and its Gaylesville mines, about 30 miles northeast, from which comes the excellent Dirtseller red ore, running 50 to 52 per cent. in metallic iron, from 9 to 11 per cent. in silica and about 4 per cent. in alumina. Across the Georgia line, 40 miles further to the northeast, are the brown ore properties of the company, acquired in the purchase last year of the Georgia Iron & Coal Company interests.

Coal for boilers and gas producers at Gadsden comes from the company's Altoona mines, 18 miles west of Gadsden, while coke is brought from its 300 coke ovens at Virginia, 15 miles southwest of Birmingham, this being the longest haul for any of the raw material assembled at Gadsden. Limestone is shipped either from

Trussville, Ala., where the company's Ella Furnace is located, or from Rock Springs, 8 miles east of Gadsden.

The expectation is that ultimately all the product of the blast furnace except that of Sundays will be taken to the open hearth plant as hot metal. A Heyl & Patterson pig casting machine is in use, and all cold metal is chill cast. At present the furnace is producing about 225 tons a day, using 2½ tons of ore to a ton of pig iron. The metal delivered to the steel works runs from 0.75 to 1 per cent. in silica and 1 to 1.25 in phosphorus.

The Open Hearth Plant.

As indicated in Figs. 1 and 2, the original open hearth plant built in 1903 consisted of four furnaces. The addition of two furnaces on which work was begun in the fall of 1906 is now being completed, giving six furnaces of 50 tons capacity and an average daily output of about 550 tons, allowing for furnaces out for repairs. The company is thus in position to market a moderate tonnage of billets as such, the capacity of its wire mills at Ensley being about 400 tons a day, with the increase in equipment made in recent months. The steel for the open hearth building, which with the addition is 456 ft. long, with a width of 203 ft., was erected by the Riter-Conley Mfg. Company, Pittsburgh, Pa. The designs for the entire open hearth plant, the blooming mills and accessories were furnished by the Garrett-Cromwell Engineering Company, which was engineer for the steel plant construction. A section of the open hearth building, scrap yard and scrap track platform is given in Fig. 3. The furnaces are 14 x 32 ft. and are equipped for the charging of direct metal. On the pouring side are a 75-ton ladle crane and a 30-ton auxiliary and on the charging side a 40-ton ladle crane built by the Morgan Engineering Company, Alliance, Ohio. The charging machine is of the standard low type of the Wellman-Seaver-Morgan Company. Charging boxes are loaded from cars in the stock yard, deposited by crane on cars traversing a platform outside the charging floor and on the same level, the cars being switched to the charging floor by means of a small locomotive. Commanding the stock yards are two 5-ton Morgan cranes. The gas producers are of the Forter-Miller type, having shells 10 ft. in diameter. At the open hearth producer house and at the producers auxiliary to the pit furnace house the coal is delivered from a trestle directly upon the producer floor. For the four original open hearth furnaces four producers each were provided; the two additional open hearth furnaces have five producers each.

From the open hearth building the ingots are taken, on their way to the pit furnace building, to an Aiken ingot stripper, which was built by the Hydraulic Machine Company, Pittsburgh. In the ingot heating department, Fig. 4, are three four-hole soaking pits, and a Morgan ingot crane is provided for charging and drawing. This building, which is continuous with the blooming mill, is 151 ft. long by 88 ft. 6 in. All the buildings connected with the blooming mill plant were erected by the Forest City Steel & Iron Company, Cleveland, Ohio. The 36-in. two-high reversing blooming mill, with its shears, tables, scrap conveyor, ingot tilter, &c., was furnished by the United Engineering & Foundry Company, Pittsburgh, Pa. The shears are capable of cutting steel up to a 10-in. square section. The main reversing tables in the blooming mill are driven by 12 x 12 in. Otis Elevator Company reversing engines; the approach table by a 50-hp. Westinghouse motor, and the shear table by two 30-hp. Westinghouse motors. The shear table is of the Garrett-Cromwell tilting type, similar to one installed at the Clairton plant of the Carnegie Steel Company. By dropping the end of the table a large opening is left, which allows crop ends to drop directly upon the scrap conveyor.

The blooming mill is driven by a pair of 50 x 60 in. reversing engines built by the Wm. Tod Company, Youngstown, Ohio. The boiler house contains eight 375-hp. Stirling boilers, equipped with Parson blower system.

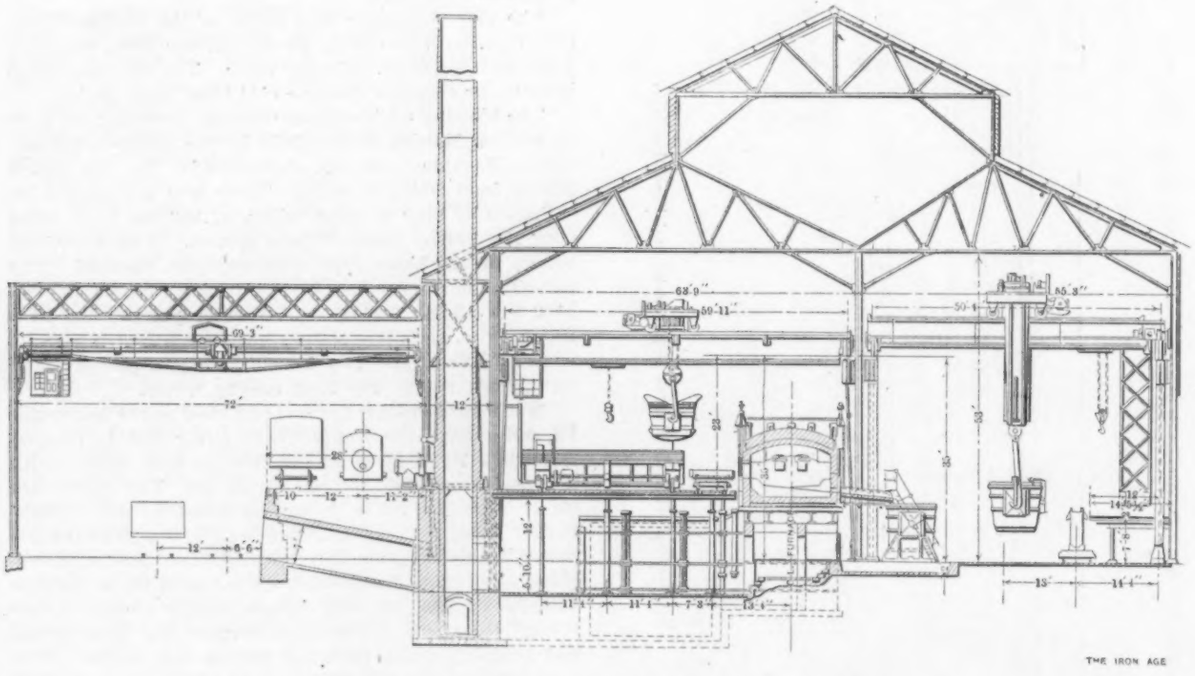


Fig. 3.—Section through Open Hearth Building, Scrap Platform and Scrap Yard.

At the end of the blooming mill, as shown in Fig. 2, is an L 182 ft. long, with a crane runway, two 15-ton Morgan cranes being provided for loading billets into cars. For convenient handling the billets are cradled, discarded galvanizing pans from the company's Ensley plant being used for this purpose. The ordinary product of the blooming mill is 4 x 4 in. billets.

The basic steel produced at the Gadsden plant has proved well adapted to the requirements of the wire mills. Its softness and ductility are such that it has often been possible at the Ensley plant to draw down to No. 18 wire without annealing. The use of Horton continuous wire drawing machines, recently installed at Ensley, contributes to the further reduction of the drawing cost.

Present Productive Capacity.

The present rate of production of the Southern Steel Company from its various mineral and iron and steel properties is as follows:

Iron ore from mines at Gaylesville, Porterville and Crudup, Ala., and Estelle, Oremont and Rogers, Ga., 1800 tons daily.

Coal from mines at Virginia and Altoona, Ala., and Dunlap, Tenn., 3200 tons daily.

Coke from 300 ovens at Virginia, Ala.; 300 ovens at Trussville, Ala.; 164 ovens at Dunlap, Tenn., and 75 ovens at Call City, 1000 tons daily.

Limestone from quarries at Trussville and Rock Springs, Ala., and Rising Fawn and High Point, Ga., 800 tons daily.

Pig iron from furnaces at Gadsden and Trussville, Ala., and Chattanooga, Tenn., 600 tons a day. The company's furnace at Rising Fawn, Ga., will be in operation in the next 30 days.

Steel billets from the Gadsden, Ala., open hearth plant, 550 tons daily.

Wire products from the Ensley, Ala., plant, 400 tons daily.

The officers of the Southern Steel Company are the following: Chairman, C. P. Perin, New York; president, Moses Taylor, New York; vice-president, E. T. Schuler, Gadsden, Ala.; treasurer, A. R. Forsyth, Birmingham, Ala.; secretary, R. D. Carver, Birmingham, Ala.

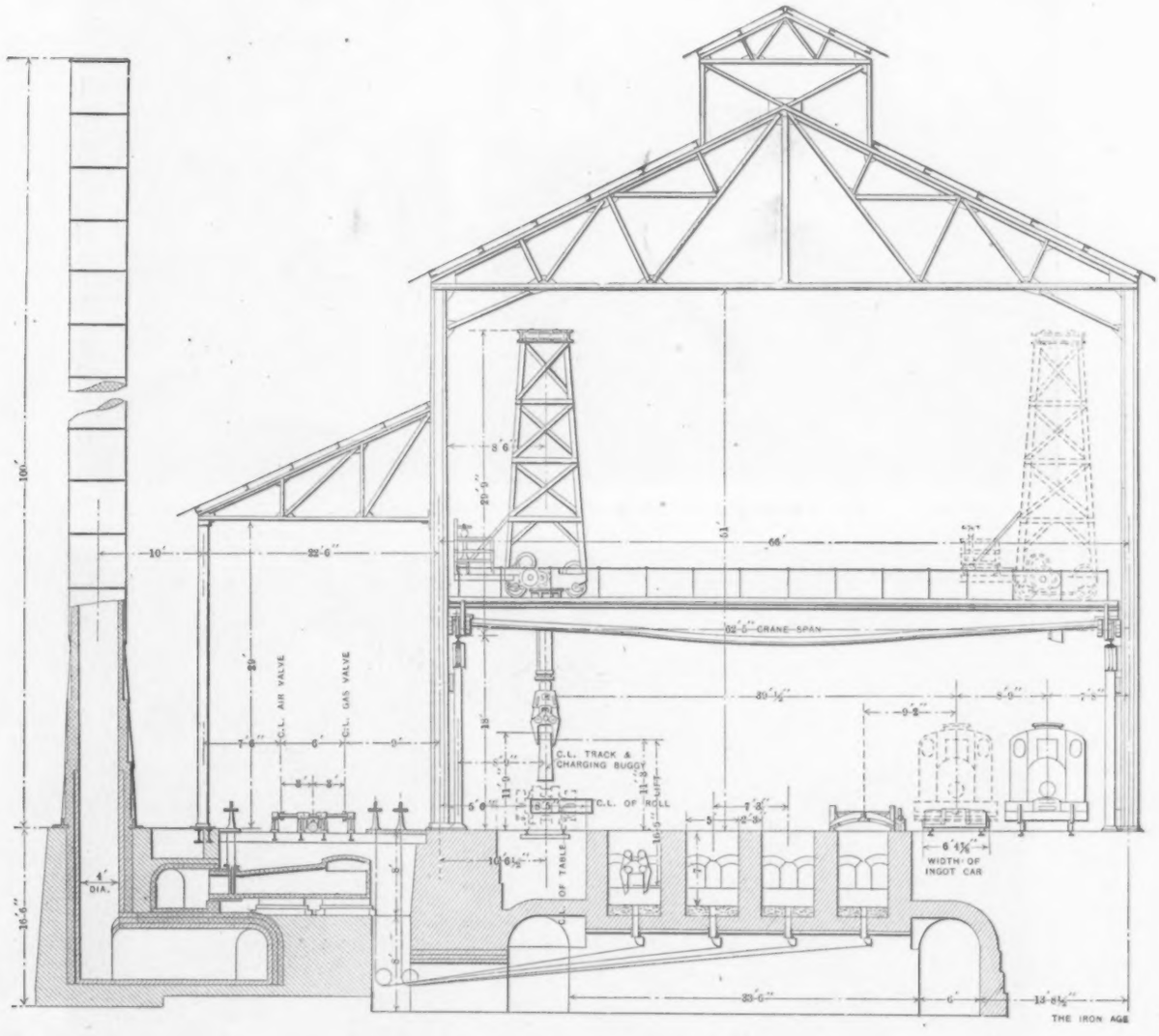


Fig. 4.—Section through Pit Furnace Building.

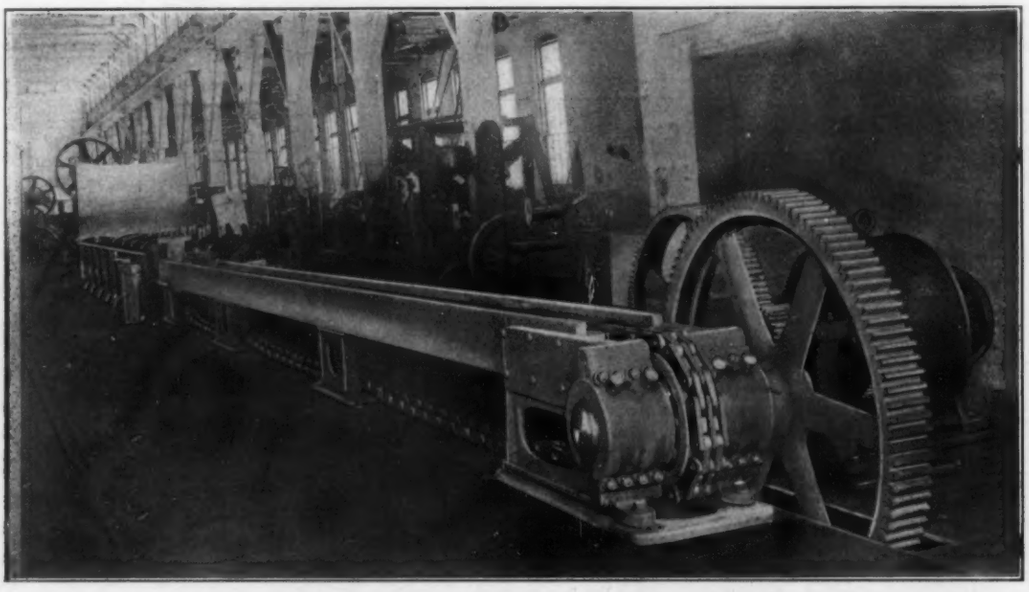
Hopper Compartment Lake Vessels.

The Automatic Shipping Company, incorporated at Buffalo, will establish a shipbuilding plant in that city for the construction of a new type of lake vessel, embodying the hopper car principle applied to a bulk freight steel steamship. A steamship constructed upon this principle is in effect a series of steel hoppers ranged longitudinally for the carrying of bulk freight, such as grain, ore and coal. The advantages claimed for the hopper style of interior hull construction are twofold. First, the hoppers are so shaped that grain and other bulk freight will seek the center of the bottom of each hopper, and in the case of grain will automatically trim the elevator leg, dispensing with the steam shovel and almost entirely with the work of scoopers; second, the water ballast is divided by the hopper bulkheads and cannot "slush" fore and aft in bad weather, and furthermore the division of the hull into hopper spaces almost completely insures the boat against sinking in case of collision. The waste lateral space between the tapered sides of the hoppers is compensated for by the gain from water ballast space necessary in the present form of construction, this space being 6 ft. in depth in large freighters as at present built, but only 3 ft. in depth in the hopper style of construction, the depth of the hoppers being greater than the hold of the present standard construction, by reason of their penetrating deeper into the water bottom space of the hull, and the water ballast space rising higher between the hoppers. George W. Maytham, for many years connected with marine interests in Buffalo, is the inventor of the hopper style of construction, which is covered by patents. The first vessel of the type is now under construction at Buffalo, and will be completed September 1. It will have steel hoppers 6 ft. 9 in. wide, fore and aft, at the bottom, and 12 ft. long, from side to side of the vessel, at the bottom, the vessel being 55 ft. in width over all. The hopper principle and the Maytham construction devices have been strongly indorsed by practical vessel men for the safe and expeditious handling of bulk cargoes.

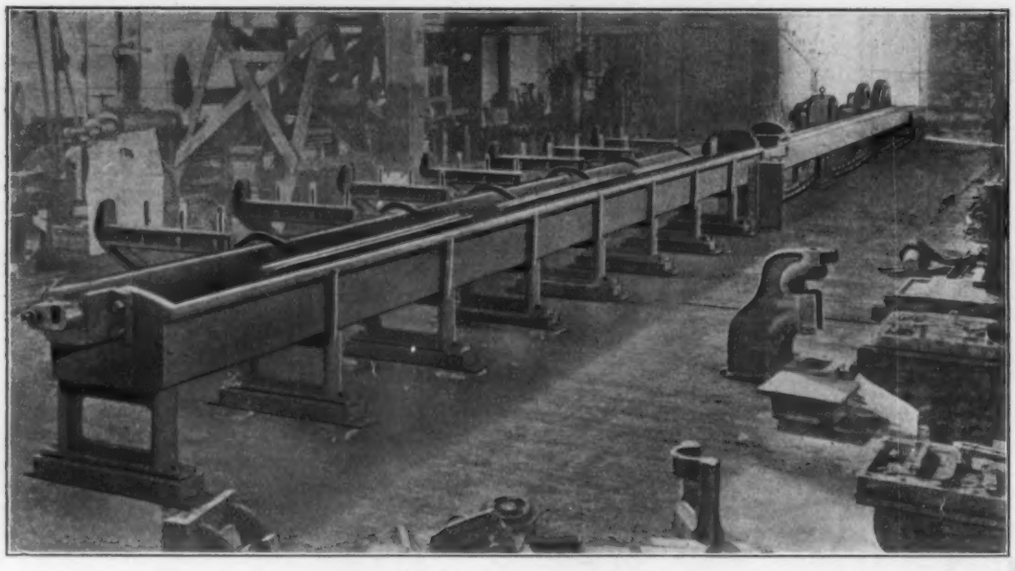
A contract for supplying 65,000 tons of rails has been awarded by the Temiskaming & Northern Ontario Railway Commission to the Algoma Steel Company at Sault Ste. Marie. The commission is operating and extending the Ontario Government's road running throughout the greater part of the length of the Nipissing District.

The Perkins Motor Driven Draw Bench.

The draw bench shown in the illustrations is notable for its size and strength, as well as from the fact that it is driven by a direct connected motor. Its capacity is 75 ft., and it is designed to do tubing and bar work for the large manufacturers of tubing. It will take in up to a 3-in. round bar. The machine is driven by a 60-hp. Westinghouse motor, which drives through a chain of powerful gears. These gears are all machine cut, which eliminates practically all noise, making the draw bench run very freely. It requires but 4 hp. to keep it running idle, although some idea of the size of the machine may be obtained from the fact that it requires 7½ hp. to start it, using the entire capacity of the motor when drawing tubing of 3 in. in diameter.



Driving End of the Perkins Motor Driven Draw Bench.



Other End of the Perkins Motor Driven Draw Bench.

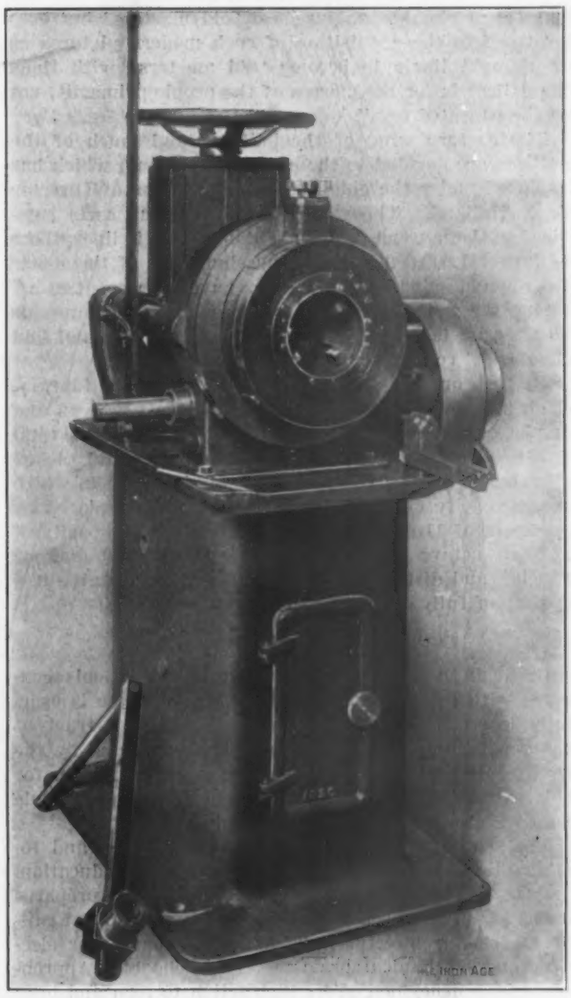
The jaws which take the tube are dovetailed into heavy forgings called tongs. By placing the handle of the tongs in the proper position, it engages the chain, this method permitting a quick interchanging from one form to another for the different shapes of tubing. The chain is alternate two and three links, the links being 1¼ x 3 in. in section, all links being countersunk and the rivets headed over. The machine is absolutely controlled by an electric car controller which is conveniently situated at the side of the machine. The draw bench terminates in a dip box for the lubricating bath. A rack takes the tubes from the muffler, whence they are transferred to the dip box. Triplet holders hold up the tubes when they come off the rod. The usual triplet adjustment is seen at the end of the dip box. These draw benches are built in six sizes, the illustrations showing the largest one. The Perkins Machine Company, Warren, Mass., is the builder.

The construction of a destroyer, with 30,000 hp. in five gas engines, each propelling a screw, it is announced, is to be started by Lewis Nixon, following the lead of the British Government, which is at present building a destroyer of 1800 tons displacement, to be propelled at a maximum speed of 36 knots, by steam turbines of 30,000 hp. The maximum speed of this new vessel it is said will be 33 knots, while it is announced that a sufficient quantity of fuel will be carried to enable the craft to cross the Atlantic to England at a speed of 30 knots, or in four days. The great difficulty with regard to this part of the programme is based upon the fuel consumption of the engines. Many destroyers are afloat which could accomplish this feat were only this phase of the subject absent. It is stated that in the present case, however, the gas engines, which are each of 6000 hp. (the largest marine gas engine heretofore built is 500 hp.) will be so economical as to make possible the projected transatlantic trip at a speed greater than has ever yet been deemed possible.

The Loew Victor Power Pipe Machine.

As an extension of the line of pipe threading and cutting off machines known as the Loew Victor pipe machines, the Loew Mfg. Company, Cleveland, Ohio, has brought out two new sizes, Nos. 4 and 5, of the pattern as illustrated. These are primarily intended for power drive, although they may be hand operated like the Nos. 1, 2 and 3, which were described in *The Iron Age*, March 29, 1906. The three smaller sizes are designed for mounting on a bench or a light four legged stand. The two new and larger sizes are mounted on cast iron column type bases with oil pan tops. This is the most distinguishing difference between the new and older machines, although there are also changes and improvements in the head proper that are deserving of mention.

An outboard support has been added for the guide



The No. 4 Power Driven Pipe Threading and Cutting Off Machine Made by the Loew Mfg. Company, Cleveland, Ohio.

rods holding the vise member, and a change has been made in the trip for retracting the dies and a star feed has been added for the cutting off tool. The dog, which when thrown to position, causes the dies to gradually open, is now located on the base instead of the stationary part of the head, as on the smaller machines. This dog when moved to a vertical position engages a lug projecting from the face plate, and the continued revolving of the head retracts the dies.

In general the head is of substantially the same construction as before, and the drive is through a double lead worm engaging a worm wheel on the head. A two-step cone pulley takes the place of a hand crank on the right side of the machine, although one is still provided for use on the left side should it be inconvenient to provide power. The power drive provides two speeds from a countershaft with a two-step cone pulley. The worm wheel is of bronze and the worm is steel, and the shaft carrying the worm is provided with a ball bearing thrust collar and runs in oil, so that friction is reduced to a minimum. This driving mechanism has been found more efficient than one using bevel gears, and an even smaller amount of power is required.

The dies are in four parts, are made of high grade steel, and can be reground by a novice, inasmuch as the grinding does not change the shape of the cutting face of the die. The Loew Victor die head is distinctive in that the dies are self-locking, requiring no special device to prevent slipping after the operation of threading a piece of pipe is begun. The dies engage in a continuous scroll on the back of the face plate, through which the adjustment is effected, and when the pressure of the pipe is against the dies it is impossible for them to slip.

The vise is a universal self-centering vise with two long bearing jaws of tool steel, which are made to rigidly clamp the pipe by the large hand wheel at the top. The additional bearing for the rear of the vise guides insures the rigid holding of a long pipe, so that it will not be thrown out of line with the dies.

Another special feature of the machine is the solid bar cutoff, so-called because it works through the die head instead of being attached to the face. The feed of the cutting off tool is operated through the star wheel at the top of the head, which with the feed dog in proper position, is revolved a quarter turn at each revolution of the head.

The No. 4 machine is intended for threading pipe from 1 to 4 in. in diameter, and occupies a floor space of 27 x 17 in. The hight to the center of the pipe is 34 in., and the over all hight 48 in. The weight of this machine is about 1100 lb. The No. 5 machine weighs about 1450 lb., and occupies the same floor space as the No. 4, but it measures 52 in. high over all, and 36 in. from the floor to the center of the pipe. Both machines are regularly furnished with countershafts and a rotary geared oil pump, which automatically lubricates the dies and cutting off tool while the machine is in operation.

The operation of the machine is very simple. After the dies are set in proper position by a bar inserted in holes in the face plate it is only necessary to start the pipe into the dies by drawing forward the long vertical lever at the left. After the pipe is started into the dies the feed continues automatically, and after a proper length of thread has been cut throwing up the latch dog causes the gradual retraction of the dies. This has the effect of taking the burrs off the thread, and the quick opening feature avoids the necessity of reversing the machine and backing the pipe out of the dies.

W. N. Kratzer & Co.'s Improvements.—W. N. Kratzer & Co., Pittsburgh, builders of iron and steel construction work of all kinds, are erecting a steel frame building, 45 x 100 ft., to be used for fabricating girders and columns, the new building to be located beside the present plant on Smallman street. It will be equipped with a 10-ton electric crane driven by Westinghouse motors, and a Whiting equipment trolley. It will also have an overhead trolley and runways to facilitate handling material while being fabricated. To the equipment will also be added punches, riveting machines, a rotary planer, &c., of modern types. It is expected that this building will be ready for operation by April 15. The firm also has in contemplation the erection of a steel frame building over its structural stock yard to measure 60 x 100 ft., and to be served by a 10-ton electric crane. This building will likely be erected within the next 60 days, while a storehouse, 25 x 120 ft., is now being added. This firm is completing a contract for the structural steel work for a large grain elevator in the West and a train shed, elevated trestles and approaches and has recently secured a contract for the steel work for a 10-story office building. In addition it has contracts for about 1100 tons of structural work, including 900 tons for a paper mill, the balance being small work. The concern recently shipped a steel hoisting derrick to South America and has contracts on its books for warehouses and steel buildings for manufacturing interests involving considerable tonnage.

The Carnegie Institute, Pittsburgh.

On Thursday, Friday and Saturday of this week the new and enlarged building of the Carnegie Institute, Pittsburgh, will be dedicated with imposing ceremonies. The occasion will be made exceptionally memorable by the presence of famous scientists and other distinguished men of learning from the Old World as guests of Andrew Carnegie, the founder, and by a great gathering of America's representative men on invitation of the trustees.

Foreign Representatives.

Great Britain's representatives include Edwin A. Abbey, an American painter, although resident in London; Sir Robert Ball, director of the Cambridge University Observatory; C. F. Moberly Bell, manager of the London *Times;* Sir Robert Cranston, Lord Provost of Edinburgh; Sir Edward Elgar, a musical composer; Hammond Hall, editor of the London *Daily Graphic;* the Very Rev. John Marshall Lang, principal of Aberdeen University; Guglielmo Marconi of wireless telegraphy fame; Dr. P. Chalmers Mitchell, secretary of the Zoological Society of London; Sir William Henry Preece, a well-known electrical engineer; Dr. John Rhys, principal of Jesus College, Oxford University; Dr. E. S. Roberts, master of Gonville and Caius College, Cambridge University; Dr. John Ross, chairman of the Carnegie Dunfermline Trust; the Earl of Southesk, chief of the Carnegie family; Clement K. Shorter, editor of the London *Sphere;* William T. Stead, a noted English writer, and Sir William Turner, principal of Edinburgh University.

Holland will be represented by Joost Marius Willem Van der Poorten Schwartz, a novelist, better known in this country under his pen name of "Maarten Maartens."

Representing France will be: Leonce Benedite, director of the Luxembourg Gallery of Paris; Prof. Marcelin Boule, director of the Museum of Natural History, Jardin des Plantes, and one of the leaders of scientific thought in Paris; Baron D'Estournelles de Constant, member of the French Senate; Camile Enlart, director of the Trocadero Museum in Paris, and J. T. Homolle, director of the Gallery of the Louvre.

Germany sends as its representatives these well-known men, who are designated by the Kaiser himself: Dr. Reinhold Koser, chief director of the Prussian State Archives; Ernest E. von Ihne, court architect; Lieutenant-General Alfred F. J. L. von Loewenfeld, general adjutant to the Emperor, and the only soldier on the list of guests, as well as the personal representative of the German ruler; Theodor von Moeller, Minister of State, and Prof. Fritz Schaper, a distinguished sculptor; Prof. Friederich S. Archenhold, director of the Treptow Observatory.

Belgium will be represented by Baron Descamps, Minister of State and a professor of international law, as well as a member of The Hague Court of Arbitration.

The Scope of the Institution.

It would be difficult to find an institution more comprehensive in its scope than that which was founded by Mr. Carnegie. It now comprises five great departments—the library, the museum of natural history, the art gallery, the music hall and the newly created technical schools. The structures in which the institute is housed are situated in Schenley Park, one of the most attractive pleasure grounds in the city of Pittsburgh. Mr. Carnegie first broached the subject of establishing a free library in Pittsburgh in 1881, but owing to the laws existing at that time the gift could not be accepted until 1887. He finally gave $1,000,000 to the project, and then gave additional funds for enlarging the institution. The main building is the one about which much of the ceremonial part of the celebration will center. It is superbly proportioned, so much so that its massive details are at first hardly realized. It has a frontage of 400 ft. along Forbes street and 600 ft. along Mawhinney street, and covers almost 5 acres of ground. It was erected around the old Carnegie Library, almost every part of which was remodeled, save the music hall, which has been left intact, except for the upholstering of its furniture.

The building's interior finishing presents a constant succession of beauties. Six thousand tons of the finest marble obtainable in all of the world's best quarries have been used, and 16 varieties have been utilized. It is found in lovely patterns on the floors, in splendid surfaces in the walls, and rears itself in massive beauty in monolith piers and columns.

The center of the front of the building is occupied by the Hall of Architecture and the Hall of Sculpture, the establishment of which required four years of unremitting work on the part of the director of the Department of Fine Arts, John W. Beatty. They are filled with masterpieces of painting, architecture and sculpture, and are veritable treasure troves to art lovers.

One of the most important developments in Art Museum policy was that embodied in a suggestion made last week by Mr. Carnegie himself in making his latest gift to the institute. It is embodied in his words: "The art department should not purchase 'old masters,' but confine itself to the acquisition of such modern pictures as are thought likely to become 'old masters' with time. The gallery is for the masses of the people primarily, not for the educated few."

The eastern wing of the building and much of the southern are devoted to the enormous museum which has developed under the able and tireless efforts of Director W. J. Holland. The collections of various sorts comprised in the museum are made along gigantic lines, there being over 1,000,000 insects alone, hundreds of thousands of birds and coins, while fortunes have been spent in acquiring the world's greatest fossil remains. In minerals the museum is particularly rich, while its mammal and ethnological collections are extremely valuable.

In the court in the center is the Carnegie Library, which is in every particular one of the most modern and complete libraries in the world. Beginning with a total of 16,000 volumes, it has swelled to a splendid picked collection of 225,000 volumes. The old book stack, which had a capacity of 200,000 volumes, has been replaced by a new one of 11 stories in hight, which has a capacity of 1,500,000 octavo volumes, and the library's numerous branches and distributing points about the city give it a capacity of fully as many more.

The Technical Schools.

Great in potentiality are the technical schools connected with the institute, in which Mr. Carnegie is especially interested. The schools are built on a tract of land consisting of 32 acres, which was presented by the city of Pittsburgh. There has been ample provision for their expansion, so that they will inclose a quadrangle about which will be homes of the industrial arts.

The schools comprise four organic divisions, and together provide a complete system of technical education. First is the School of Applied Science, which prepares youths of 16 who desire to take up some specialized calling, such as architecture, chemistry, railroading or electrical and mechanical practice. The School of Apprentices and Journeymen offers instruction to men and boys already at work at some trade, who can become skilled mechanics by studying at night the higher and theoretical branches of their vocations.

In the School of Applied Design is given instruction in technical design and in mechanical processes used in the various arts. The Technical School for Women, which is one of the most important departments of the division, prepares women for earning a livelihood. These schools especially appeal to the practical and far-seeing mind of the founder.

On April 5 Mr. Carnegie presented to the trustees of the institute $4,000,000, doubling the previous endowment, and in addition $1,000,000 for further extensions to the Technical Schools and $1,000,000 for use when the latter are opened to scholars. In this connection he said: "I think the Technical Schools rank first in practical importance, since they chiefly instruct the sons and daughters of workers in the mills and factories, who labor through the day and seek instruction at night. Their success under Dr. Hammerschlag has been phenomenal, and they should, and no doubt will, receive your unfailing support."

The Promise of the Carnegie Institute.

Writing on this subject in the *Business Monthly* of Pittsburgh, Samuel Harden Church, secretary of the Carnegie Institute, says:

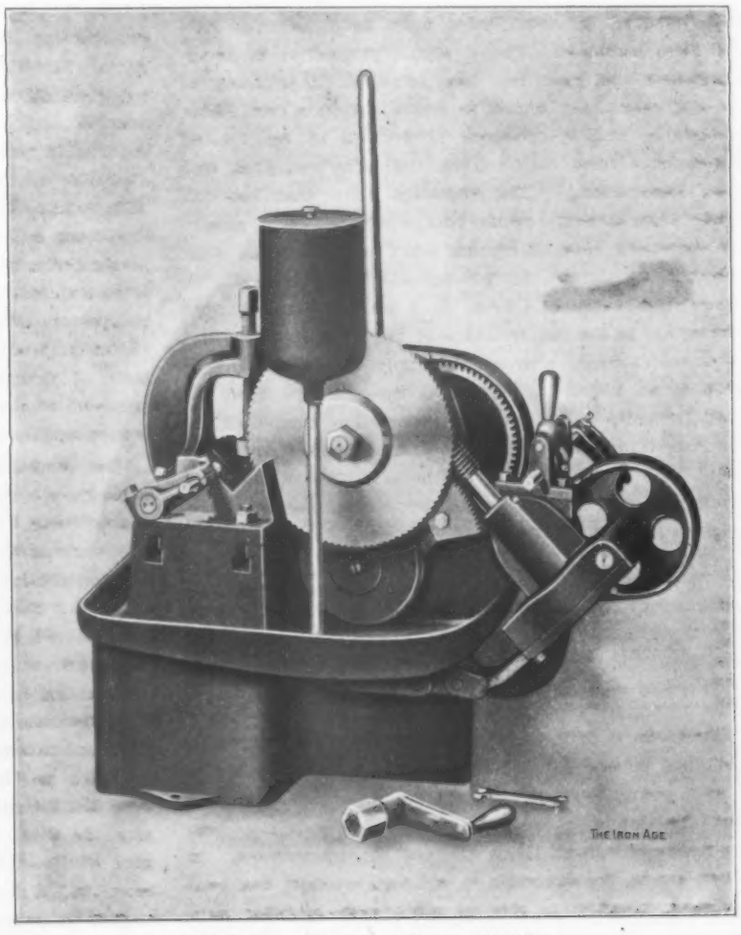
"When the building is completed, it will not be the finish but only the beginning of its real usefulness. A community which has until now been held down to hard facts will then launch into the pursuit of ideas. Every man who has an interest in the welfare of his country should perceive the increasing value of a higher education, not only for his own children, but for the masses of the people; and this higher education should, while embracing the modern essentials of engineering and mechanical courses, at the same time be guided back into some of the old channels of literature and art."

The Cochrane-Bly Metal Sawing Machine.

The cold saw cutting-off machine shown in the illustration is designed for general shop use in cutting off stock up to 4 in. in diameter. The particular aims of the builder, the Cochrane-Bly Company, Rochester, N. Y., were to make it as small and compact, moderate in price and simple in construction as is consistent with the rapid and accurate cutting of stock within its capacity. The saw is carried by a swinging carriage pivoted to the base of the machine, and is fed into the stock by a screw, which engages a segment of a worm wheel on the carriage. The feed drive is through a worm and worm gear, which are in turn driven by a belt from the driving shaft. The feed screw is thrown into mesh with the worm gear by a hand lever and is held by a pawl. An adjustable stop may be set to release the pawl, and a spring disengages the screw, stopping the feed at any point in the travel of the carriage.

The saw spindle is of large diameter, hardened and ground, and is accurately fitted in a solid cast iron bearing. The drive of the saw is through a train of spur gears and hardened steel pinions, the ratio being 36 to 1, thus furnishing ample power. The diameter of the saw is 13½ in., and the hight of the vise from the floor is 18 in. A drip pan for oil and chips surrounds the table, and an oil tank is furnished to supply oil to the saw while cutting.

This machine was exhibited in operation at the recent Boston Automobile Show. It was run steadily, cutting 3-in. round cold rolled steel at the rate of 2¾ min. to the cut, and attracted a great deal of attention, effecting many sales.



The Cochrane-Bly Metal Sawing Machine.

War Restrictions on Wireless Telegraphy.—Regulations covering the use of wireless telegraphy in time of war have been made public by the Institute of International Law, according to advices from Ghent, Belgium. Belligerents may prevent the transmission of Hertzian waves by a neutral State over the high seas within the sphere of their military operations. All persons taken prisoners while receiving or transmitting wireless messages from belligerent territory, or between different sections of a belligerent army, are to be treated as prisoners of war, and not as spies, unless their operations were carried on under false pretenses. Carriers of dispatches received by wireless, who make use of concealment or ruse in their work, are to be regarded as spies. Neutral ships or balloons proved to have been used to furnish an adversary with information helpful in the conduct of hostilities may be removed from the zone of operations and the wireless apparatus on board confiscated. A neutral State is not required to prevent the passage across it of Hertzian waves destined for a country at war. It may, however, close or take over a wireless telegraph station of a belligerent if operated in its territory.

The Progress of the Canadian Tariff.

TORONTO, April 6, 1907.—The new tariff is now through the House of Commons. The last debate in committee took place on the first inst., and had reference to the duties on agricultural implements. A member from Saskatchewan moved that the general tariff on mowing machines, harvesters and reapers be reduced from its present rate of 17½ per cent. ad valorem to 10 per cent. It was stated in the debate that though the duty has been lowered 2½ per cent., the price in the West has gone up. The amendment was defeated, and the rate stands at 17½ per cent. In the course of the debate the leader of the opposition complained of the meagerness of the information furnished by the Government, maintaining that the Tariff Commission should have been able to advise the House correctly on at least these three points: 1. What is the cost of the manufacture of these implements? 2. What is the price in Canada, compared with the price at which the implements are sold in the markets of the world? 3. Are the excessive prices due to a combination among the manufacturers?

C. A. C. J.

Arthur J. Lockwood, iron and steel merchant, 12 Platt street, New York, has recently opened a warehouse at 51 Bowne street, Brooklyn. The building was one of the old machine shops of the Henry R. Worthington Pump Works, and is well suited to the purpose. When this new warehouse is fully stocked up, Mr. Lockwood will have much more on hand of the classes of material carried by him than he has heretofore been able to handle.

THE IRON AGE

1855—1907.

New York, Thursday, April 11, 1907.

Entered at the New York Post Office, as Second Class Mail Matter.

DAVID WILLIAMS COMPANY, - - - - - - - PUBLISHER
CHARLES KIRCHHOFF, - - - - - - - } EDITORS
GEO. W. COPE, - - - - - - - - - }
A. I. FINDLEY, - - - - - - - - -
RICHARD R. WILLIAMS, - - - - - - - - HARDWARE EDITOR

Manganese Ores and Metals.

The statistics of ferromanganese imports to the United States in 1906 show that that was the record year for such imports, the total being more than those of 1904 and 1905 combined. The domestic production of ferromanganese last year has been exceeded three times in the six years for which separate statistics for ferromanganese and spiegeleisen production in the United States have been collected by the American Iron and Steel Association. The statistics show that imports, rather than domestic production, are relied on to supply the increased demand coming from our expanding steel industry, so far as ferromanganese is concerned. In spiegeleisen there has been more response in domestic production to the requirements of the steel industry, but here, too, foreign sources of supply have been drawn upon to an increasing extent as the pressure upon the blast furnaces of the steel companies has compelled the concentration of their capacity upon Bessemer and basic iron. The table below gives the statistics of domestic production and importation of ferromanganese and spiegeleisen in the past six years, in gross tons:

	Ferro.		Spiegel.	
	Domestic.	Imports.	Domestic.	Imports.
1901	59,639	20,751	231,822	26,827
1902	44,573	50,388	168,408	62,813
1903	35,961	41,518	156,700	122,016
1904	58,022	21,814	162,370	4,623
1905	62,186	52,841	227,797	65,457
1906	55,520	84,358	244,980	103,267

Previous to 1901 the statistics of domestic production combined in one total the ferro and spiegel production of each year. Leaving out 1904 the above table indicates that the domestic production of spiegeleisen has been approximately four times that of ferromanganese. In other words, the domestic spiegeleisen product has been sufficient, roughly, to give as much more metallic manganese as is contained in the output of domestic ferromanganese, if we take it that on the average the ferromanganese produced in the United States yields four times the percentage of manganese contained in spiegeleisen. The year 1904 was exceptional in having low imports of both ferro and spiegel, particularly of the latter. There was plenty of steel company blast furnace capacity idle in the United States in that year, and no reason relating to foreign ore supply why the ferro and spiegel required at home should not have been made at home.

The average value of ferromanganese imported last year reached high level for recent years, being $58.72 a ton, as against $35.67 a ton for the imports of the calendar year 1905. In the statistics of declared values for preceding years, which are given by fiscal years, the lowest average was $36.45, in the fiscal year 1902 and the highest $50.77, in the fiscal year 1901. For 1907 the average is likely to go quite as high as for 1906 and probably higher, judging from the basis of recent heavy sales for the second half of the year.

Since the United States is dependent so largely upon foreign sources for its manganese ores, these fluctuations in price are liable to come, apart from general trade conditions at home. Yet the demand from this country, with its rapidly increasing production of steel, will continue to be the greatest factor in the market for manganese ores and metals, and any increase in foreign supplies of ore is of special significance to our steel industry. The disturbed labor conditions in Russia, which have affected shipments from the mines of the Caucasus and of southern Russia, are indicated by a falling off in imports of manganese ores to the United States last year to 221,260 gross tons, the imports in 1905 having made a record at 257,033 gross tons.

So far as the United States is concerned, manganese ore development in recent years has amounted to very little. For 1905 and the two preceding years the average production of ores yielding 40 per cent. or more of metallic manganese was about 3400 tons a year, while for the 17 years beginning with 1905 the average was 11,700 tons. High point was reached at 25,684 tons in 1890, while for 1905 the total was 4118 tons, of which 3947 tons came from Virginia. There is a steady production of manganiferous ores, however, chiefly from the Lake Superior region. In 1905 the lake production, with manganese content of 1 to 8, was 720,098 tons, while Colorado produced 45,837 tons with from 14 to 41 per cent. of manganese, and Arkansas 3321 tons, with 28 per cent. of manganese. These ores have entered largely into spiegeleisen mixtures.

The condition of the United States in respect to true manganese ores is very much like that in regard to tin—a practically complete dependence upon outside sources. The various operations are in many hands and concentration of ownership seems not to have been attempted in any of the principal producing countries. Naturally interest will be taken in the United States in such developments as are going on in India, where rich mines are making larger outputs each year, with the prospect that the mining of these ores will become one of the principal industries of the country. The Brazilian mines exported to Great Britain and Continental Europe in 1905 134,200 gross tons and to the United States 99,750 tons, the total, 233,950 tons, being nearly twice the aggregate of Brazilian shipments prior to 1900, these having been 125,620 tons. The world's production of manganese ores is now probably at a rate exceeding 1,100,000 tons. The latest figures show that in 1905 Russia produced 426,813 gross tons; Brazil, 233,950 tons; India, 150,297 tons; Germany (1904), 52,886 tons; Turkey (1904), 49,100 tons; Spain (1904), 26,895 tons; Chile (1903), 17,110 tons; Austria, 13,788 tons; Hungary (1904), 11,527 tons; France (1904), 11,254 tons; Japan (1902), 10,592 tons; Greece (1904), 7355 tons; Cuba, 6907 tons. Cuba ceased making shipments in 1905, and the nearest important operations to the United States, those of Brazil, promise to be of increasing importance to the steel industry of this country. There is some mitigation of our condition of absolute dependence on foreigners in the fact that the world's supply is increasing and that, barring the effect of wars, the competition will be sufficient to become to some extent a governor of prices. In time the Brazilian ores should be an important factor in the trade between the United States and South America.

Railroad Rates and Capitalization.

The proposition to appraise railroad properties and adjust rates so as to insure not more than a reasonable return on the cost thus shown is likely to continue to figure considerably in discussions of the railroad question. It is, of course, assumed by the advocates of such an appraisement that it would show that the railroads of the country could be replaced at very much less than the alleged fictitious cost represented by their stocks and bonds. The assumption is that the railroads are overcapitalized, the proposed appraisement being advocated for the purpose of squeezing out the water. There might be, though it should be said softly so as to give no offense, a possibility of such an appraisement showing that the railroads could not be replaced for anything like the amount represented by their stocks and bonds. In that event, and this question should be asked even more softly, would the advocates of adjusting rates to the cost of a railroad favor an advance in the rates to bring them up to a proper return on the investment as shown? If a railroad was thus demonstrated to be carrying freight and passengers too cheaply, so cheaply in fact that it was paying its stockholders no dividends, would the advocates of appraisement make the patrons of that railroad contribute enough in addition to their present charges to enable fair dividends to be paid? It is a poor rule which does not work both ways. Yet it seems quite likely that not a few railroads are to be found which could make such a showing if put to the test. The patrons of the roads, however, would certainly not be pleased.

The assumption that capitalization governs the rate charged is a fallacious one. Even taking the worst law for making rates ever laid down by a railroad manager, it shows no relation to the capitalization. That law was promulgated many years ago, and in terse form was as follows: "Charge all that the traffic will bear." Rapacious as this seems to be, exorbitant as the charges may have been which were scheduled under it, the fact is nevertheless recognized by it that a point can be reached which the traffic will not bear. Even at that time charges could not be made which were absolutely unreasonable. Crudely as the recognition was given, there was nevertheless the recognition of an economic law. To such a law President W. W. Finley of the Southern Railway Company alluded in a recent address when he said:

> Capitalization may affect the intrinsic value of a company's securities, and thus affect the investing public. It cannot control a carrier's rate, and hence cannot affect the shipping public.
>
> No rate can ever, with proper consideration for the business of the country or of the carriers, be made independently of these economic laws; not by legislation arbitrarily fixing the rate, and not by capitalization of the carrier likewise arbitrarily fixing the rate. In a broad sense, therefore, the management of a railroad is powerless to fix its rates. It must accept the rates that are the resultant of economic and commercial forces which are absolutely beyond the control of its managers as are the tides of the ocean.
>
> That this is true is further shown by the fact that many railroads have never been able to pay dividends on all of their capital stock, while others are unable to pay any dividends at all, and still others are not able to pay interest on their bonded indebtedness. If a railroad could adjust its rates to its capitalization there would be no reason why any road should not earn dividends on its capitalization, and thus forever abolish receiverships and bankruptcy.

Those who believe that capitalization governs railroad rates would surely not be guided in their purchase of groceries by the capital which a grocer might allege he had invested in his business. Nor would they admit that the price of pig iron bears any relation to the capital invested in a blast furnace. As the prices of ordinary commodities are fixed by competition or by the supply and demand, so railroad rates are adjusted from time to time by influences to which even the most stubborn rate-making official must bow. Rates must be sufficiently low to attract traffic, as the traffic must be had or the railroad will go out of business.

Scarcity of Homes for New England Workmen.

A number of important manufacturing industries located away from large centers of population, and even some of those in cities of considerable size, have been compelled to create villages of their own, building houses for their employees, because of the scarcity of rentable property. This scarcity is partly due to the very rapid growth of manufacturing and the consequent increased forces of workmen required, and partly to the fact that private enterprise is shunning this class of investment property because of the very high prices of all kinds of building materials. While a great deal of new building of all descriptions is being done, not enough of it is of the sort that is available for the average workman, who wishes comfort at a moderate price. Workmen have been able to pick and choose their places of employment during the past year or two. Once satisfied to travel considerable distances night and morning between their homes and their work, they have been more inclined of late to seek employment where they can have a comfortable home near at hand, that less of their leisure time may be consumed in daily travel. The result is a condition which is compelling some manufacturing establishments to provide homes for their men.

The textile mills have always maintained villages of their own, and in the past have made satisfactory profits from this class of investment. Occasionally a metal working establishment located in the country has had its own village, in order that its workmen might have homes near by. Model factory villages, established in connection with industries seeking the most perfect environment for their help, have been much discussed. But to-day a new class of shop and factory community has come into existence, compelled by force of circumstances, not as an investment which will net profits of any amount, but in order that industrial forces may be maintained at full strength, and that growth may be possible by the addition of more men as they are required.

Instances could be cited of works which have been compelled to do their expanding in several communities instead of in one, because of the scarcity of labor due to an inadequate supply of rentable houses of the right sort. Some small cities and large towns have been serious losers because their real estate owners did not make provision for the housing of the families of workmen who would contribute to their growth and wealth. There are cities which would be better served by associations organized to provide workmen's homes than by the encouragement of new industries.

The general condition is fully appreciated by those managing great establishments, whose growth has been more than normal during the past few years, in which the prices of building materials have so greatly advanced. They realize that something must be done to keep their people satisfied in this respect and to provide suitable homes for new men as they are gathered from other places where industrial growth is not so rapid. The manufacturer who provides such buildings is, of course, contented with a smaller percentage of income from the investment than the private individual, whose only viewpoint is that of the actual return on his money from each house owned by him. This latter consideration has made

itself felt in another form—namely, a material advance in rents—which is another strong incentive to workmen to seek employment where manufacturers provide houses for their employees.

CORRESPONDENCE.

Electric Steel Works in Europe.

To the Editor: We have studied with considerable interest the list of electric steel furnaces in Europe, given in *The Iron Age* of March 28. We are sorry, however, to note that a number of omissions of the Kjellin furnace occur in your list, and we have thought accordingly an official list from us showing the Kjellin furnaces at present in operation (or about to be constructed) in Europe might be interesting. The list is as follows:

1. Gysinge, Sweden; 150 kw.
2. Gurtnellen, Switzerland; 320 kw., for the International Calcium Company.
3. Volklingen, Germany; Rochling'sche Iron Works, as under:
   - *a.* 50 to 75 kw. furnace.
   - *b.* 110 to 120 kw. furnace.
   - *c.* 736 kw. furnace (in course of construction, capacity 24 tons.)
   - *d.* Furnace of a capacity of 150 tons in course of construction.
4. Krupp, Germany; 746 kw. furnace.
5. Poldihutte Company; 300 to 400 kw. furnace in course of construction.
6. Guldsmedshyttan, Sweden; 300 to 400 kw. furnace in course of construction.
7. Vickers, Sons & Maxim, Sheffield, England; 200 kw. furnace.
8. Araya, Spain; 200 kw. furnace.

AMERICAN GRONDAL KJELLIN COMPANY,
J. A. RAWLINS, Vice-President.
45 WALL STREET, NEW YORK, April 5, 1907.

The Use of Ferrosilicon in the Foundry.

To the Editor: Referring to the discussion in your columns on the use of ferrosilicon, my letter contained an error—the dates as given, 1895-1894, should have been 1905 and 1904. This error was most unfortunate, but, in regard to Mr. Outerbridge's statement of the date at which he began his experiments, I am quite certain that in his original account of the work which he did along these lines the date of the beginning of his experiments was indirectly located by his statement about the first of 1905. Other duties keep me from keeping a complete file of Mr. Outerbridge's publications, but I think I can find a statement of his to this effect if necessary.

In regard to the statement that electrolytic ferrosilicon was made at Lockport in 1888, I have questioned J. E. Johnson carefully, and he assures me that one of the excursions made by a portion of the American Institute of Mining Engineers in the autumn of 1888 was to the aluminum works of Cowles Bros. at Lockport, where they saw ferrosilicon made in the electric furnace, tapped from the furnace and run out on plates, and that pieces of the ferrosilicon so made were given to those present as souvenirs. Under these circumstances Mr. Outerbridge's statement that he had no information about this will undoubtedly be accepted as correct, but it will be taken by those logically inclined to prove, not that the facts are not as stated, but that Mr. Outerbridge's knowledge of the subject was less comprehensive than he believed.

If any one desires confirmation of these facts, some of the members of the institute who were present on that occasion can possibly supply it.

Mr. Outerbridge also assumes that I do not "realize the vast difference in making crude castings from direct metal and the refined work produced in first-class foundries." This is another one of those cases in which Mr. Outerbridge's assumptions are not quite coextensive with the facts, which are that while the great majority of castings made at blast furnaces from direct metal are crude, it is perfectly possible to make as refined a product in this way as can be turned out from any foundry. There is, I know, a common belief among foundrymen that this is not true, but having seen it done for the last 20 years and having built much machinery, all the castings for which were made in precisely this way, I may perhaps be excused for holding the contrary opinion.

In regard to the matter in issue, the date at which ferrosilicon was used in ladles for softening hard iron, I have a blotter gotten out previous to June, 1904, by Matthew Addy & Co., in which ferrosilicon is recommended for use in exactly this way. Incidentally, it is the 50 per cent. kind that is so recommended. It may, therefore, be assumed that the use of ferrosilicon in this way was a matter of ordinary commercial knowledge at that date, which precedes, by some time, the application of Mr. Outerbridge for a patent, which application was dated November 9, 1905.

As a matter of collateral interest it may be noted that Mr. Outerbridge claims, as an important part of his invention, the use of 50 per cent. ferrosilicon. As a matter of fact, the first experiment at Longdale was made with 75 per cent. ferrosilicon, and such good results were obtained that the change to 50 per cent. was only made when it became too difficult to get the 75 per cent.

Considering all the circumstances, it seems to me, therefore, that Mr. Outerbridge's patent covers a process which, in its general principle and all its important details, was in current use before he made any successful experiments on the subject, and that therefore his patent is of no effect whatever. It is my personal belief that any one may use ferrosilicon in the way described without any risk of being compelled to pay Mr. Outerbridge a royalty. J. E. JOHNSON, JR.

GLEN WILTON, VA., March 25, 1907.

The Conference of Stove Founders and Molders.

The joint annual meeting of representatives of the Stove Founders National Defense Association and the International Molders Union of North America was held in Chicago at the Auditorium on March 26, 27 and 28. Delegates present at this meeting were as follows: Representing the Stove Founders' National Defense Association: D. McAfee, Quincy, Ill.; E. W. Peck, Rochester, N. Y.; A. C. Mott, Philadelphia, Pa.; L. Crowley, Detroit, Mich.; S. R. Baldwin, Pittsburgh, Pa. Representing the International Molders' Union of North America: Joseph F. Valentine, Cincinnati, Ohio; M. J. Keough, Troy, N. Y.; C. T. Nevius, Taunton, Mass.; Thos. B. Kenny, Detroit, Mich.; Jesse Hencock, Quincy, Ill.; Joseph Rohlman, Columbia, Pa.

The matter of chief importance that engaged attention at this meeting was the advance of 10 per cent. in wages asked by the molders. After protracted discussion on both sides an advance from 20 per cent. on board prices to 25 per cent. was finally agreed upon, which amounts to a practical increase of 5 per cent. over the present wage schedule. Instead of fixing the wage schedule for a one-year period, as heretofore, the present agreement is made effective until 1909.

An effort was made by the Stove Founders' National Defense Association to have the date of the annual conference between the two bodies changed from March to December. It was argued by the manufacturers that, as their salesmen start out in January and begin contracting for stove deliveries extending through to the latter part of the year, the basis of labor costs should be established on the product involved prior to that time. No final decision upon this point was reached at this meeting, but the question of change to the early date suggested will come before the Molders' Union's convention, to be held in June at Philadelphia. Other matters transacted were of routine character.

The Clipper Plow Company, Defiance, Ohio, manufacturer of agricultural implements and pressed sheet steel specialties, advises us that it is manufacturing a sheet steel case for holding bottles very extensively, having among its customers the largest brewers in the United States. The statement in *The Iron Age* for March 28 that the American Steel Package Company of the same city is the only company manufacturing sheet steel cases for holding bottles was given upon the authority of that company, but, as above noted, it proves to have been incorrect.

Fluxes and Alloys.*

BY ALEXANDER E. OUTERBRIDGE, JR.

Did I but possess the rare genius of Mark Twain for discussing a serious matter in a humorous vein, I should feel tempted to take advantage of the fortuitous combination of the foregoing title and the date (April 1) on which I have been invited to address you, to indulge in a few amusing reminiscences of personal experiences in connection with the mysteries of various fluxes and alloys that have been compounded and sold from time to time during 30 years past for the treatment of foundry iron.

Who, among the older foundrymen present, can fail to recall the days when the visits of peripatetic self-styled doctors of metallurgy were far more numerous than they are to-day? These gentlemen usually carried in their grips sundry little packages of fluxes or "alloys" which were warranted to cure all the ills to which molten foundry iron was then as now subject. On the advent, in later years, of the chemist in the foundry, these visits became fewer and fewer, until to-day they are comparatively rare (at least in the larger establishments), for, as a rule, the doctors dealt largely in vague mysteries and disliked exceedingly to subject their compounds to the scrutiny of the analyst.

Years ago I made a collection of the contents of a number of such packages and found that they consisted, for the most part, of certain quite innocuous materials, such as black oxide of manganese, white soda ash, brown resin, charcoal and other kinds of coal, iron filings, sand, ground oyster shells, &c., carefully mixed together in order to disguise the various ingredients. Fluxes of such kinds were intended to be put into the ladles, not into the cupolas, being too valuable to be thus wasted.

The peripatetic experts were usually veteran molders, or at least men familiar with foundries, and depended for success upon their gift of gab, enabling them frequently to sell their harmless nostrums to trusting foundrymen at fancy prices, comparing favorably in this respect, in a small way, with the truly remarkable exhibits on a large scale that we have to-day recorded in the bronze gas fixtures, steel filing cases and other trimmings in the new capitol building at Harrisburg. It is but just, however, to say that while there were many fakes in the days alluded to, created and fostered by the prevailing ignorance of foundry foremen, there were at the same time a number of skilled men who journeyed from place to place instructing foundrymen in cupola management and other details of the founder's art. Lacking Mr. Clemens' vein of humor I will now proceed in a serious way to discuss briefly the subject of fluxes and alloys.

Fluxes.

Before proceeding to consider the subject of fluxes it should be clearly understood that the discussion will necessarily be limited to the study of their function in the cupola, and of their effect upon the melting and properties of pig iron when thus melted. The same limitations will apply to the study of alloys, for the subject is far too extensive to permit of more general treatment in one brief thesis.

The action of fluxes in a blast furnace, where iron oxide (ore), mixed with gangue, is reduced to the metallic state, is essentially different in many respects from the action of fluxes in a cupola, where the reactions in a blast furnace do not take place. So also the action of fluxes in a reverberatory furnace or in any open hearth steel furnace is different from that in a cupola or in a blast furnace. Likewise the action of fluxes on steel or other metal melted in crucibles is dissimilar from that of the other metallurgical operations here named.

In blast furnace operation, as well as in reverboratory furnace melting, or in open hearth and crucible melting, fluxes set up important chemical reactions, such as separating the nonmetallic elements from the metallic elements, or in refining metals by eliminating impurities; while in melting pig iron in a cupola there is but little opportunity, even if the desire exists on the part of the melter, to change the character of the iron greatly by eliminating impurities. In the first place, there is not sufficient time, and in the second place the temperature at which melting is conducted in cold blast cupolas is not sufficiently high to enable considerable changes in composition to occur. It is, first and last, a simple melting operation, and the fewer the changes in composition of the metal the better. Certain minor changes do occur in spite of all precautions; for example, sulphur in the coke used for melting has a strong affinity for the molten pig iron when dropping like rain through the glowing mass of fuel; lime also has a strong affinity for sulphur, and it is a prevailing opinion that a lime flux is beneficial in cupola melting for this reason.

Lime is, undoubtedly, beneficial as a flux under most, if not all circumstances, in melting in a cupola, but whether its advantage is due to the cause named, except in slight degree is, I think, an open question.

Other changes undoubtedly occur, such as the burning out of some silicon and some carbon when melting pig iron in a cupola. Still another change occurs, of more or less consequence, depending upon the character of the iron melted and upon the blast pressure, namely: the relative proportion of free carbon or graphite and of combined carbon (iron carbide) may be altered sufficiently to radically change the physical properties of the metal, even though the total carbon remains practically unchanged.

A CHANGE THAT EVADES THE CHEMIST.

Last, I am convinced and have maintained for many years that a serious change is produced that evades the chemist, and is, therefore, not revealed in analyses, which may and probably does have more influence on the product than any or all of the other changes combined. I allude to the dissolving in the iron melted in a cupola of a small amount of iron oxide, the oxidation of the molten iron taking place as it is dropping through the oxidizing zone near the tuyeres. This dissolved iron oxide is, in my judgment, a weakening element.

Fluxing iron in a cupola has, as I have stated, but little effect upon these changes; they are inherent in the method of melting.

What then is the true function of fluxing of a cupola? My reply is that fluxing with limestone, oyster shells, fluorspar, &c., is useful mainly for the purpose of making a more fluid slag, thus preventing the slag formed from the nonmetallic substances, such as ash, sand, scoria, iron oxide, &c., from clogging the cupola when the bottom is dropped, or from becoming mechanically caught in the stream of molten iron as it escapes from the spout. If you have a thick, pasty slag you are apt to have dull iron and dirty castings.

Fluorspar, regarding which there has been some acrimonious discussion in the technical papers, makes an extremely fluid slag and is therein beneficial, but unfortunately it also has a destructive action on ordinary cupola linings, and should be used cautiously on this account. The claim that fluorspar imparts any other beneficial influence on the molten iron lacks confirmation from analyses, and is suggestive in its vagueness of the ancient claims of the foundry doctors, already alluded to, who passed away nearly a generation ago.

There does not appear to be any established rule or custom among foundrymen regarding the proper quantity of flux, or the best method of changing it in the cupola in order to obtain economically the best results; the proportion of flux to iron melted varies all the way from 1 to 20 to 1 to 60 or over. Sometimes the flux is placed on the bed of coal, sometimes on top of the iron charges, sometimes it is used only at the beginning, sometimes only at the end of the heat, and more often, perhaps, with every charge of iron. Where such wide latitude in method exists in practice it is fair to infer that the use or nonuse of fluxes in melting pig iron in a cupola has but little effect upon the character of the iron—*i. e.*, upon its component elements.

In my own practice, extending over about 30 years, I have tried all of these methods, and a great variety

* Paper read before the Pittsburgh Foundrymen's Association, April 1, 1907.

of fluxes, while for some time past I have been using no flux of any kind in the cupola. It is proper to explain in this connection, however, that in this case no coke is used, the melting in the cupolas being effected with anthracite coal, as economically at present prices as with coke, and with distinct advantages over coke with respect to the smaller amount of sulphur absorbed by the iron, the lesser quantity of slag formed, the greater length of time the metal will remain fluid after tapping, &c. The slag formed, when melting with anthracite, is so small in quantity that it is not tapped from the slag hole provided for the purpose and the space between the tuyeres and the lining of the bottom of the cupola is much less than is necessary when coke is used as fuel.

Whenever the ratio between cost of coke and anthracite has been in times past in favor of coke, I have used that fuel, either with anthracite or alone, as the case may have required; but, all other things being equal, I prefer anthracite to coke for melting pig iron in a cupola.

To sum up in a few words, it may be readily inferred from the foregoing statements that I do not rely upon fluxing to improve the quality of the iron melted in a cupola, except in a very limited degree, but that I do recognize the advantage accruing from the moderate use of fluxes, especially when coke is the fuel employed, in order to increase the limpidity or fluidity of the slag, thus to assist the passage of the air blast through the burden, and finally to insure a clean drop when the melting is over.

Alloys.

So much has been written on the subject that I shall confine myself to alloys of metal with cast iron, and I shall still further limit this discussion to a consideration of such alloys as I have myself made and tested.

Pig iron itself is a complex alloy, but it is only in comparatively recent years that it has become so regarded by foundrymen. Some conception of the true nature of cast iron lodged in the minds of a few investigators, it is true, earlier than some of us might imagine; for instance, a little over a quarter of a century ago the following appeared in print in a magazine:

> Manufacturers are beginning to realize that pig iron is not a simple element, but is in reality an alloy composed of a number of substances; that its physical characteristics, such as strength, elasticity, &c., depend upon the percentages of these constituents, and that pure iron, like pure gold, is always the same thing, physically and chemically, no matter from what source it may be obtained.
>
> I believe that the time is coming when pig iron will be sold on its chemical analysis, instead of on the crude methods of grading at present in vogue. And further, that, as the naturalist can tell the genus of an animal from an examination of a single bone, so the chemist will tell the characteristics of a mass of iron from the analysis of its component parts.—(*Penn Monthly*, February, 1882, A. E. O., Jr.)

How many persons realized at that time that the pure element of iron, which comprises more than 90 per cent. of the metal we call pig iron, is absolutely identical in all kinds of crude pig iron and in all kinds of steel; that the multifarious variations of physical properties of different kinds of iron and steel are due entirely to the varying proportions of the other elements, which, in the case of steel, may not in the aggregate amount to as much as 1 per cent. of the total weight, and in the case even of crude pig iron do not equal 10 per cent. of the total weight of the metal?

How many persons believed at that time the prediction then made that pig iron would be sold on its chemical analysis, instead of by fracture, within a single generation? We have lived to see this and a great deal more than this accomplished, and it is not unlikely that still greater changes may come in the near future.

Dr. Moldenke has said that "the coming use of ferroalloys is destined to play an important part in rescuing the business of the gray iron founders from the threatened invasion of the makers of steel castings." This invasion has become a serious one in some branches of the founder's trade, and is constantly extending in various directions, especially in those where strength and lightness of weight of castings are important desiderata. Heretofore the producer of gray iron castings, having the field all to himself, cared little about the strength of his metal, and as he usually sold his castings by the pound he was not interested in reducing the weight. These conditions have changed, and as a consequence improvements are now being made in the quality of iron castings, whereby strength is increased and weight is decreased.

The physical properties of cast iron—namely, strength, ductility, fracture (*i. e.*, coarseness or fineness of grain), softness or hardness, &c.—depend not alone upon the chemical composition, but also upon the rate of cooling from the molten condition; therefore, a grade of iron which is suitable for pouring a large casting of thick section, taking hours or sometimes days to cool, is absolutely unsuitable for pouring a small or light casting, which "sets" immediately, and in most cases must be soft enough to machine readily.

If we could control accurately the melting of pig iron in a cupola it would be a comparatively simple matter to charge the furnace with different grades of iron, like layer cake, and draw off the different layers as desired for the castings. This method is, in point of fact, followed to-day with more or less success, so that it is customary in some establishments to tap at least three different grades of iron from one cupola in one heat every day, care being taken to pour the castings according to a prearranged order. These may vary from little pulleys with rims less than ¼-in. thick in some cases, up to anvil blocks, bed plates for heavy machinery, &c., weighing many tons.

THE SIZE OF TEST PIECES SHOULD ALWAYS BE STATED.

For reasons herein given, I have heretofore maintained that tensile strength, records of cast iron as given in technical books and magazines, have no meaning or value unless we know the size of the test pieces; a difference of one-quarter inch in diameter of two round tensile test bars cast from the same ladle of iron may make a difference of as much as 5000 lb. per sq. in. in the record of tensile strength. Moreover, with one kind or grade of iron the larger bar may be always the weaker, while with another kind of iron the smaller bar may always be the weaker of the two. I have many records of such tests to substantiate these surprising statements.

These facts surely suffice to prove that in cast iron we have an alloy of highly complex nature. It is a melange of half a dozen well-known elements and not infrequently contains a trace of one or more comparatively rare metals, all of which exert an influence upon the properties of the alloy. Thus, a small amount of titanium hardens cast iron, while tungsten, strange to say, seems to have an opposite influence. It is frequently asserted that a trace of copper renders cast iron very brittle. Yet I have alloyed copper with cast iron in various amounts from one-tenth of 1 per cent. to 1 per cent. and have failed to discover this tendency. It certainly closes the grain. Platinum is a metal which cannot be melted except by means of the electric arc, but an alloy may be readily made with molten cast iron, even after its removal from the cupola. The alloy is interesting to investigators but has no commercial usage. The cost of platinum equals that of gold, but when my experiments were made platinum was about one-third its present value.

THE ORDINARY CONSTITUENTS OF CAST IRON.

You are all no doubt familiar with the ordinary constituents of cast iron and even a brief discussion of their effects upon the metal would be too elementary for this audience. I will, therefore, only pause for a moment to point out one or two common errors that are continually being perpetuated in new text books.

Thus, for example, manganese is, I believe, invariably stated to be a hardening element in cast iron. This is misleading. Manganese, it is true, is a hard, white, brittle metal, and the alloy known as ferromanganese is so hard that it cannot be drilled. When present in excess, say, 4 per cent., manganese certainly makes gray iron very hard, but it is hungry for sulphur and oxygen, and when added in powdered form in a small quantity in the ladle of molten high chilling metal, such as car wheel iron, instead of increasing the hardness of the metal it has quite an opposite effect, because of its desulphurizing and de-

oxidizing influence. One pound of this powder added to a ladle of 600 lb. of car wheel iron changes nearly one-half of the combined carbon to the graphitic form. It lowers the shrinkage of the metal nearly 25 per cent. and takes out nearly one-quarter of the sulphur, the result being a marked softening of the gray iron portion of the casting and an immense improvement in the strength and ductility of the car wheel poured from metal thus treated, as compared with a similar wheel cast from the same metal untreated.

In 1885 and 1886 I made a very large number of such tests, showing that the addition of a very small quantity of powdered ferromanganese to ladles of molten car wheel iron produced a remarkable effect upon the metal, increasing the strength and resilience, thus enabling the wheel to withstand shocks in service which would otherwise cause it to crack.

A report of these experiments may be found in the *Journal* of the Franklin Institute for March, 1888, wherein it is said: "The result of several hundred carefully conducted experiments which I have made enables me to say that the transverse strength of the metal is increased 30 to 40 per cent., the shrinkage is decreased 20 to 30 per cent., while nearly one-half of the combined carbon is changed into free carbon."

Ten years later, in 1898, J. E. Cartwright, writing on "Manganese in the Foundry," said: "Since Outerbridge made known the results of his experiments the car wheel foundries during the last 10 years have generally adopted the use of ferromanganese, and established the fact of beneficial results from its use in the class of work they make. The powerful action of a small quantity of finely ground or powdered ferromanganese added in the ladle to chilling irons has gradually become known to them in the last 10 years, and one after another they have adopted its use, and the fact that once adopted, they never change to their old practice, is good evidence that it yields results that are satisfactory. That there has been no deterioration, but, instead, a great improvement in the quality of car wheels made by the method now used, is shown by the fact that the severity of tests prescribed by railroads and the guaranteed life or mileage of wheels have been raised repeatedly during the last 10 years; and yet the car wheel makers have kept pace with these severer requirements, and have no trouble in making wheels by this modern method that easily meet these higher test and guarantees. The method followed by car wheel foundries is practically that described by Mr. Outerbridge."

Manganese has been universally maligned as a hardening element in cast iron, the authors of such statements failing to realize that it performs two distinct functions: one as a hardening element, if in excess; the other as a softener of high chilling iron when that element is otherwise deficient in quantity. In one case the manganese acts *per se* as a hardening constituent, in the other instance its function is that of a deoxidizing and desulphurizing flux, exerting thereby a softening effect upon the metal.

I may say, furthermore, that if the founder allows the proportion of manganese to fall too low—say below 0.3 per cent.—he is certain to have complaints of hard castings. This was clearly shown in a paper on "Hard Castings," read by Henry Souther at the eighth annual meeting of the American Society for Testing Materials, July, 1905, and printed in volume 5 of its *Proceedings*. After stating that castings had been submitted to him for examination on account of being too hard to machine, he says he found that the "constituents were normal except manganese, namely: Silicon, 2.50 per cent.; phosphorus, 0.70 per cent.; sulphur, 0.08 per cent.; carbon, 3.50 per cent.; manganese, 0.16 per cent plus. Means were taken to raise the manganese to the neighborhood of 0.50 per cent., and as soon as this was done the difficulty disappeared in the machine shop and has not reappeared after months."

THE GREAT SOFTENER.

Silicon is the great softener of all kinds of cast iron and is usually added in the cupola in the form of "silvery gray pig," which may contain anywhere from 4 to 10 per cent. of silicon. Sometimes alloys containing even more silicon are added with pig iron in the cupola, for the purpose of enabling the mixture to carry a larger proportion of scrap than would otherwise be prudent. Silicon charged into the cupola softens the metal, but also always reduces its strength.

I have announced on several occasions during the past two years, and published in various papers, the interesting and I believe valuable discovery that when an alloy of iron and silicon is added to ladles of molten iron, in the form of high grade ferrosilicon (containing about 50 per cent. of the latter metal) it not only softens, but at the same time strengthens, the iron, thus reversing the universal experience that when you soften iron you reduce its strength.

The gain in strength varies with the kind of iron and the proportion of ferrosilicon added to the ladle. In some of my tests I have found an increase of over 25 per cent. in strength, with a decrease of hardness that is quite remarkable. These tests are easily made in any foundry where transverse test bars are cast and broken.

Another interesting and important feature of this method of manipulation is that by varying the amount of powdered material added to the ladle the proportion of silicon can be changed to suit the requirements of any individual casting or any group of castings. As I have already described these experiments in detail in papers that have been published, I presume they are familiar to you all and I will, therefore, refrain from going into further details at the present time regarding them.

I have hastily, and I fear imperfectly, discussed the subject of fluxes and alloys as related to foundry practice in cast iron. In doing so I have endeavored to avoid as much as possible going over ground that is familiar to all, and, at the risk of appearing egotistical, I have given the results of some personal observations and experiences extending over a period of about 30 years, during which time changes of great magnitude have occurred.

Some idea of the phenomenal growth in the manufacture of pig iron in this country in a single lifetime may be gained by the statement that in the year of my initiation in the mysteries of the foundry business the total production of pig iron was less than 1,900,000 tons, while last year the output exceeded 25,000,000 tons. In conclusion, I venture to hope that even though this paper may not prove entertaining it may convey a little instruction in a small branch of the founder's art.

Referring to the accumulation of surplus in the United States Treasury, the *Bankers' Magazine* notes that the Treasury has been for some time an active factor in causing contraction of the currency. At the close of February the surplus for the first time went above $400,000,000, this amount including the $150,000,000 gold reserve now required by law to be maintained against the legal tender notes outstanding. From July, 1906, to March 1, 1907, the increase in surplus was $80,000,000. In that period the excess of government revenues over expenditures was about $55,000,000. Of the $250,154,654 available Treasury cash balance on March 1, the amount in national bank depositories was $150,486,235 and the balance in the Treasury $99,668,419. At the end of March the available cash balance was $252,635,509.

Three German engineers who were sent by the municipality of Hamburg to study the tunnel work now in progress in New York City began their investigations last week, starting with the Pennsylvania tunnel. The city of Hamburg is constructing immense docks, and it is necessary to build a tunnel under the Elbe. It will be about 1500 ft. long, and for much of that distance it will be necessary to cut through rock and sand. Caissons and compressed air will be used, as the tunnel will be about 90 ft. below the water level. The swiftness of the Elbe tides makes them dangerous for ferries to cross and the municipality chose between a bridge and a tunnel. It was found impossible to construct approaches on practicable grades to a bridge as high as the conditions demanded.

PERSONAL.

George Otis Smith has been appointed Director of the United States Geological Survey, to succeed Charles D. Walcott, appointed secretary of the Smithsonian Institution. Mr. Smith was selected from a number of scientists strongly recommended to the President, including Dr. C. W. Hayes, chief geologist of the Survey; Professor Van Hise of the University of Wisconsin, William B. Clark, State Geologist of Maryland; Professor Holmes, who has recently been in charge of fuel investigations for the Survey, and others. Dr. Hayes would probably have been appointed but for the fact that he is deeply interested in certain geological investigations, and prefers independent scientific research work to the routine duties of an executive post. Mr. Smith has been connected with the Survey for about 10 years, and is recognized not only as a good field worker, but an excellent executive. His appointment takes effect May 1.

James H. Gledhill, for several years connected with the blast furnace department of the Pennsylvania Steel Company, at Steelton, Pa., has resigned to go to Roanoke, Va.

H. Mather Brooks, who was for some time connected with the National Wire Corporation, New Haven, Conn., has accepted a position in the sales department of the Jones & Laughlin Steel Company, succeeding C. S. Bradley, who has just been placed in charge of the company's Buffalo office.

Perry Davis Mackey has resigned as assistant superintendent of the Bessemer converter department of the Colorado Fuel & Iron Company, Pueblo, Colo., to become general manager of the Western Iron & Steel Company, at Denver, Colo. Morgan T. Whitehead of Youngstown, Ohio, becomes superintendent, and F. S. Rutherford general sales agent of the same company.

Gardner Cornett of Providence, R. I., has recently been elected vice-president of the American Steam Gauge & Valve Mfg. Company, his office being located at the headquarters of the company, 220 Camden street, Boston.

George Collins, secretary and treasurer of the Andrews Wire & Iron Works, Rockford, Ill., has severed his connection with that company, and is succeeded in his official capacity by Charles Andrews, Jr.

F. H. Daniels, chief engineer of the American Steel & Wire Company, has returned to this country after an absence of several months in Europe, where he has made a tour of industrial plants to look over improvements effected in recent years. He visited England, Holland, Germany, Austria, Belgium, Luxemburg, France and Italy. Mr. Daniels lays emphasis on the rapid progress which the Germans especially have made in the economical use of fuel, with gas engines, steam turbines and electrical equipment.

W. T. Archer is now manager of the Sheffield Cast Iron Pipe & Foundry Company, Sheffield, Ala., succeeding John Maitland, who had been acting manager since the death of John Thompson.

W. I. Babcock, who was president and general manager of the Chicago Shipbuilding Company at the time of its merger in the American Ship Building Company, and Henry Penton, who was chief engineer at the Chicago shipyard and afterward with the Great Lakes Engineering Works, Detroit, have formed a partnership as consulting engineers and naval architects. The offices of Babcock & Penton will be at 814 Perry-Payne Building, Cleveland, Ohio, and at 17 State street, New York.

A. Tropenas, whose name is connected with one of the steel making processes employing the small converter, will arrive in the United States from France in the early part of May. His address while in this country will be care of Powell & Colné, 11 Broadway, New York.

D. F. Morgan, chemist at the Star Furnace, Jackson, Ohio, will enter the service of the Jackson Iron & Steel Company on May 1, and will be in charge of the new furnace that company is building at Jackson.

H. S. Norton, who has been assistant manager of the Illinois Steel Company at Joliet, Ill., has been made manager of the Gary Land Company, which has charge of the real estate interests of the United States Steel Corporation at Gary, Ind. W. J. Dagget, heretofore assistant superintendent of the Joliet mills, succeeds Mr. Norton.

N. Lilienberg, Philadelphia, Pa., who has been closely identified both as metallurgical engineer and representative of Swedish iron and steel manufacturers in this country, sailed on April 11 for an extended sojourn in Sweden.

Andrew Jackson Boyle, for many years connected with the Edgar Thomson Works of the Carnegie Steel Company and in later years night superintendent of that plant, has retired, and will spend his remaining years in well earned rest and in travel. He got his early experience with the Cambria Iron Company, Johnstown, Pa.

M. E. Wallace, formerly superintendent of the Westinghouse Air Brake Company, Wilmerding, Pa., has gone to Hamilton, Canada, to assume charge of the Westinghouse plant there. He has been succeded at Wilmerding by O. E. Buenting, formerly a department foreman.

W. B. Schiller, president of the National Tube Company, Pittsburgh, is able to be at his office again after having been confined to his home for about six months on account of a broken ankle.

S. A. Watson, formerly of the American Steel Foundries, is not connected with the proposed steel foundry enterprise, the Keystone Steel Casting Company, Chester, Pa., of which it has been stated in a daily newspaper report that he would be president.

A. S. Blagden, heretofore in charge of the National Steel Foundry Company's plant at New Haven, Conn., has been appointed manager of the Chester, Pa., plant of the American Steel Foundries.

OBITUARY.

STEPHEN Y. KITTLE, Wilkes-Barre, Pa., died April 4, aged 91 years. In 1832, he is said to have constructed the patterns for the first steam engine built in the Wyoming Valley. He was born in Greenwich, R. I.

JOHN JOSEPH RILEY, owner of the Brooklyn Steam Engine Works, Brooklyn, N. Y., died April 1, at Lakewood, N. J., aged 61 years. He was born in Manhattan, and had lived in Brooklyn since a boy. When a young man he entered the employ, in a minor capacity, of a firm of which he later became the head. He was one of the founders of the Modern Science Club of Brooklyn, and a member of the New York and New Jersey Foundrymen's Association and the National Founders' Association. He leaves a widow, two sons, and a daughter.

SIMEON J. FOX, president of the National Pipe Bending Company, New Haven, Conn., died suddenly March 25, aged 64 years. He was born at Feeding Hills, Mass., and moved to New Haven with his parents in 1850. After some experience in mercantile business he enlisted in the Union army, and served in the Civil War. He was wounded, which brought on a permanent disability and much suffering during the remainder of his life. He served as adjutant of the Second Regiment, Connecticut National Guard, and for some years was assistant adjutant-general of Connecticut. Twenty years ago he took the management of the National Pipe Bending Company, then in its infancy, and developed the business to its now very substantial proportions and high reputation. He leaves a widow and three sons.

AVERISTO L. LEWIS, for 17 years vice-president of the Scranton Forging Company, Scranton, Pa., died April 5.

CHARLES R. DARROW, formerly of Youngstown, but recently connected with the Pennsylvania Engineering Works, New Castle, Pa., died last week of injuries received in the discharge of his duties.

The second annual convention of the International Association for the Prevention of Smoke will be held in Milwaukee, Wis., June 26, 27 and 28.

The Two New Battleships.

WASHINGTON, D. C., April 9, 1907.—The designing force of the Navy Department has been spurred to such activity by Secretary Metcalf that the plans and specifications for the two new battleships authorized by the Appropriation act passed at the last session of Congress will be completed during the current week, and proposals will be requested by a circular to be issued on or before the 15th inst. The bids for the two vessels will be opened June 20.

These battleships are to exceed in size and power any vessels ever constructed for the United States navy. Up to the present time the Department has maintained great secrecy regarding the plans for these ships, even going so far as to transmit the general designs to Congress under confidential seal, notwithstanding the fact that the law required the Secretary of the Navy to submit the plans for approval before advertising for proposals. The only information regarding their chief characteristics that has been published is that given in the rather meager description printed in *The Iron Age* of March 14, 1907, page 824.

There is much interest among shipbuilders in the current rumor that contractors will be requested to submit plans for turbine engines for the two big battleships. It can be stated that the Department has this matter under advisement, and that the experts of the Bureau of Steam Engineering believe it to be entirely practicable to install engines of this type on these vessels; in fact, owing to the peculiar hull construction and high freeboard, the battleship is claimed by some experts to be better suited to the turbine engine than any other type of war vessel.

There is no truth in the reports that contractors will be asked to design liquid fuel installations for the battleships. The Liquid Fuel Board, which experimented with crude petroleum on war ships for upward of two years, reached the conclusion that owing to the necessity of transporting large quantities of ammunition on battleships, the danger of storing liquid fuel on board was so great as to offset any advantages that might accrue.

The Navy Department will also soon call for bids on the two torpedo boat destroyers authorized by the current naval appropriation bill. Plans for turbine installations will be solicited from contractors, and it is probable that at least one of these vessels will be equipped with turbines.

The recent announcement in the daily press that Secretary Metcalf had decided to have the heavy ordnance work for the two projected battleships built at the navy yards, instead of letting it to private contractors, has occasioned considerable anxiety among contractors, as it has been accepted as indicating a change of policy on the part of the Navy Department. The correspondent of *The Iron Age* is informed by the department that there has been absolutely no change in the policy with respect to Government and contract work. No decision with regard to the ordnance work for the two new battleships was arrived at by former Secretary Bonaparte, and Secretary Metcalf has decided to have the guns built at the gun factory in order that the average volume of work may continue to be turned out and the facilities of the plant continuously employed. Private contractors, however, will receive as large a proportion of naval work in the future as in the past.

The Navy Department not only desires the co-operation of private manufacturers in the construction of ordnance, but also in the experimental work now being done for the purpose of improving the quality of steel used in the manufacture of guns, armor and projectiles. The remarkable developments of the last few years in the manufacture of steel have involved so many points of vital interest to the Ordnance Bureau that it was recently found desirable to organize a board of officers to follow the developments with a view to benefiting by them wherever they present an opportunity for improvement.

W. L. C.

Owing to pressure for deliveries of rails the Carnegie Steel Company has put its Ohio Works on rails, the plant having latterly been operated on sheet and tin bars.

The Philadelphia Foundrymen's Association.

The regular monthly meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club on the evening of March 3, with a large and representative attendance of both local and out of town foundrymen. The meeting was called to order by President Devlin and routine business transacted.

Chairman Brown of the General Entertainment Committee, in connection with the coming convention of the American Foundrymen's Association, made a lengthy report on that committee's work. Plans were being satisfactorily carried out for the collection of funds to defray the necessary expenses, and the various subcommittees were actively engaged in the arrangement of details for the various entertainments. A vaudeville entertainment and smoker will be given on Tuesday evening, May 21, at Lu Lu Temple, while a shad dinner is being planned for Thursday evening, May 23. The subcommittee in charge of visitations to various industrial plants and other points of interest have their work under way and promise exceptional opportunities to those wishing to visit and inspect such plants. Plans are also being made to entertain the visiting ladies, who will be given an opportunity to visit the many spectacular and historical points of interest.

It is believed that the attendance at this convention will be the largest in the history of the association. It has been estimated that possibly 1200 members and guests will be present, and the local Entertainment Committee is making its plans so as to fully take care of the maximum number. The exhibit of the Foundry Supply Association in the Second Regiment Armory promises to be the best of the kind ever shown. Practically all the floor space has been taken, and exhibits of the latest improvements in foundry equipment, many in actual operation, will be shown. This exhibition is proving to be one of the most interesting features of the convention, and will no doubt be a factor in making the tenth annual convention of the American Foundrymen's Association the greatest ever held.

Charles J. Caley, New Britain, Conn., first vice-president of the American Foundrymen's Association, who attended the meeting, announced that the plans for the formation of a Brass Founders' Association, which is to be organized at the time of the convention, were well in hand, and that the committee having this matter in charge were very much encouraged by the interest taken in the matter by those engaged in the brass trades.

The paper for the evening was on "The Hazard of Explosives in Large Cities and Spontaneous Combustion," by Dr. Charles F. McKenna of New York. Dr. McKenna went into his subject in great detail, both historically and technically, the subject being particularly brought out by the experience of the Thomas Devlin Mfg. Company of Philadelphia, which, in making shipments of castings in second-hand kegs, found that on arrival at their destination the kegs were in some cases almost totally destroyed by fire originating in the interior of the kegs. On investigation, Dr. McKenna found that these kegs had been used for chemicals in connection with dye house work, no doubt originally containing chlorate of potassium, of which a certain portion remained in the cracks and crevices of the kegs. After packing castings in them the movement in transportation caused an explosion and resulting fire, due to the formation of an explosive compound by the chlorate of potassium and carbonaceous matter, the latter being no doubt finely divided particles of the wood of the kegs resulting from the abrasive action of the castings.

Capt. J. C. Colwell, commander of the cruiser Denver, lying at the League Island Navy Yard, made a short address on the "Possibilities of Making the League Island Navy Yard the Largest Naval Station in the World." From both a strategical and practical view, he said, this was not only possible but quite probable. The yard has a fresh water frontage of over 7 miles, and its natural advantages for naval work are unexcelled. A vote of thanks was extended the speakers for their interesting remarks, after which the meeting adjourned.

Pig Iron Production Decreasing.

The promise of a record production of pig iron in March that existed at the opening of the month when the active weekly capacity was 511,035 tons was defeated by the floods at Pittsburgh and Wheeling and by the blowing out in the month of five more furnaces than were blown in. Our statistics received from the furnaces show that the production of coke and anthracite iron last month was 2,225,175 gross tons, or about 10,000 tons less than the high record made in December, 1906. Compared with the February total of 2,045,068 tons this represents a falling off from a daily rate of 73,038 tons to 71,780 tons. Of the decrease of 1258 tons a day 1107 tons was contributed by the steel works furnaces. Since the steel works furnaces contributed practically all the gain made in February over the daily rate in January it would appear that the merchant furnace production has remained practically stationary for the past three months. The cutting down of production in the Pittsburgh District by flood was not as great as might have been expected from some of the flood reports, but there was proportionately a greater loss in the Wheeling District. On April 1 the capacity of the 313 coke and anthracite furnaces in blast was 497,456 tons a week, as compared with 511,035 tons a week for the 318 furnaces active on March 1. The table below gives the production of the coke and anthracite furnaces in March, as compared with the figures for the four months preceding:

Monthly Pig Iron Production—Gross Tons.

	November. (30 days)	December. (31 days)	January. (31 days)	February. (28 days)	March. (31 days)
New York....	134,902	134,393	136,057	126,055	151,142
New Jersey..	34,697	33,057	34,323	29,616	36,470
Lehigh Valley.	49,636	52,868	58,930	51,485	60,754
Schuylkill Val.	57,649	62,741	62,118	57,388	61,601
Lower Susquehanna and Lebanon Val.	62,016	61,481	58,101	53,010	62,946
Pittsburgh Dis.	509,211	525,312	505,514	481,868	511,637
Shenango Val.	155,698	172,604	171,830	154,966	172,748
West. Penn...	116,732	124,007	122,641	111,933	121,715
Md., Va., and Kentucky ...	86,841	85,520	87,919	83,135	91,723
Wheeling Dis..	126,796	128,294	102,158	98,929	97,158
Mahoning Val.	187,261	187,577	196,426	168,187	179,001
Central and North. Ohio.	173,444	162,930	172,031	171,838	185,598
Hocking Valley and Hanging Rock	35,690	35,509	31,911	33,606	33,792
Ill.,Mich.,Minn., Wis., Mo., and Colo.	265,893	290,281	283,934	259,964	278,655
Alabama	150,506	139,432	145,233	126,642	142,281
Tennessee, Georgia and Texas	40,093	39,309	36,481	36,446	37,954
Totals	2,187,665	2,235,306	2,205,607	2,045,068	2,225,175

Production of Steel Companies.—Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Republic, Jones & Laughlin, La Belle, Bethlehem, Calumet and Colorado companies show the following totals of products month by month. We present also separately monthly figures of the production of spiegeleisen and ferromanganese, which is included in the total:

Production of Steel Companies—Gross Tons.

	Pig.—Total production.—			Spiegeleisen and ferromanganese.	
	1905.	1906.	1907.	1906.	1907.
January	1,129,042	1,358,015	1,406,397	26,305	21,477
February	1,027,937	1,226,760	1,317,923	26,988	19,444
March	1,232,255	1,400,395	1,424,827	23,595	31,091
April	1,222,710	1,333,591	.....	28,054	....
May	1,287,438	1,372,423	.....	29,447	....
June	1,149,404	1,293,437	.....	22,737	....
July	1,114,409	1,323,391	.....	20,153	....
August	1,186,050	1,237,485	.....	18,327	....
September	1,262,033	1,264,380	.....	24,078	....
October	1,370,960	1,452,200	.....	23,517	....
November	1,334,644	1,411,350	.....	29,119	....
December	1,356,962	1,445,528	.....	21,707	....

Among furnaces blown in in March were one Buffalo & Susquehanna and Lackawanna No. 1 at Buffalo, one Crane in the Lehigh Valley, one Eliza in Allegheny County, one Paxton in the Susquehanna Valley, one Ashland in Kentucky, one Crozer in Virginia, Steubenville in the Wheeling District, Spring Valley in Wisconsin, Struthers and Cherry Valley in the Mahoning Valley, and one Woodstock in Alabama.

Among furnaces blown out in March were Keystone in the Schuylkill Valley; one Shoenberger, one Edgar Thomson, one Isabella and Soho in Allegheny County; Lackawanna No. 3 at Buffalo (April 1); one Dunbar in western Pennsylvania; Cleveland in northern Ohio; one Calumet and one Iroquois in Illinois; Mayville and one Bay View in Wisconsin; Mary in the Mahoning Valley; one Woodward in Alabama; Globe, Hamilton and Milton in the Hanging Rock District.

In the following table is given the active capacity per week on April 1 and March 1 of furnaces producing coke and anthracite iron:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	April 1. Number in blast.	April 1. Capacity per week.	March 1. Number in blast.	March 1. Capacity per week.
New York:					
Buffalo	14	13	28,801	12	25,577
Other New York...	10	5	5,325	5	5,536
New Jersey.....	8	8	8,106	8	7,229
Spiegel	2	1	186	1	175
Pennsylvania:					
Lehigh Valley.....	23	20	13,097	19	12,246
Spiegel	3	3	1,071	3	1,007
Schuylkill Valley..	13	12	13,251	13	13,972
Spiegel	1	1	654	1	450
Low. Susquehanna.	8	5	5,803	4	4,959
Spiegel	1	1	676	1	675
Lebanon Valley....	10	10	7,724	10	7,618
Pittsburgh Dist....	42	38	110,895	42	120,260
Spiegel	3	3	2,534	2	1,258
Shenango Valley...	20	19	39,007	19	38,719
West. Penn.....	25	19	26,712	20	27,526
Maryland	4	4	8,710	4	8,367
Wheeling Dist.....	14	14	22,941	13	26,075
Ohio:					
Mahoning Valley...	18	17	40,908	16	40,696
Central and Northern and Michigan.	21	20	42,189	21	44,975
Hocking Valley and Hanging Rock...	12	9	6,981	12	8,397
Illinois	22	18	44,802	20	46,593
Spiegel	2	2	1,864	2	1,561
Minnesota	1	1	1,192	1	1,180
Wisconsin	5	3	2,825	4	4,055
Missouri	1	1	749	1	826
Colorado	4	3	6,216	4	8,142
Spiegel	1	1	686	0	0
The South:					
Virginia	23	16	10,012	15	10,416
Kentucky	7	4	2,586	3	2,126
Alabama	46	28	32,389	28	31,678
Tennessee	18	12	7,728	12	7,854
Georgia and Texas.	3	2	836	2	869
Totals.....	385	313	497,456	318	511,035

The active weekly capacity in coke and anthracite iron has shown the following fluctuations since January 1, 1902:

	Capacity per week.		Capacity per week.
April 1	497,456	August 1	246,092
March 1	511,035	July 1	272,301
February 1	492,359	June 1	336,107
January 1, 1907	507,397	May 1	368,244
December 1, 1906	513,860	April 1	337,257
November 1	500,580	March 1	308,751
October 1	469,665	February 1	273,692
September 1	441,426	January 1, 1904	185,636
August 1	449,908	December 1, 1903	244,156
July 1	460,570	November 1	273,715
June 1	472,622	October 1	353,142
May 1	484,031	September 1	360,197
April 1	484,240	August 1	353,681
March 1	479,737	July 1	384,825
February 1	482,156	June 1	388,178
January 1, 1906	463,673	May 1	373,496
December 1, 1905	475,814	April 1	386,215
November 1	460,449	March 1	347,424
October 1	445,468	February 1	335,239
September 1	412,563	January 1, 1903	346,073
August 1	410,088	December 1, 1902	336,617
July 1	408,617	November 1	330,110
June 1	443,092	October 1	337,837
May 1	452,031	September 1	328,243
April 1	439,564	August 1	328,745
March 1	403,157	July 1	303,793
February 1	405,792	June 1	337,492
January 1, 1905	377,879	May 1	337,627
December 1, 1904	357,846	April 1	331,140
November 1	334,249	March 1	316,039
October 1	319,249	February 1	325,440
September 1	291,573	January 1, 1902	291,992

NEWS OF THE WORKS.

Iron and Steel.

The Jessop Steel Company, Washington, Pa., manufacturer of crucible sheet steel, is contemplating the erection of a gas producer plant, owing to the uncertainty of the supply of natural gas.

The Pennsylvania Steel Company has blown in No. 3 Steelton Furnace after several weeks' suspension, when the stack was raised from 65 to 80 ft. and various improvements made.

The Cheshire Furnace, Cheshire, Mass., formerly operated by the Richmond Iron Company, but which has been idle for 16 years, is to be placed in operation next week by the Berkshire Iron Company, which took the property over some time ago. It is a charcoal furnace and for the present ore from the Richmond property will be used, but later ore from the Berkshire Iron Company's mines in Cheshire, which are now being developed, will be used. S. G. Colt is manager, and Langdon Mallory of Chatham, N. Y., will be in charge of furnace operations.

The Common Pleas Court of Washington County, Ohio, has fixed April 30 as the date for the sale of the assets of the United Sheet & Tin Plate Company, which has plants at Marietta and Newcomerstown, Ohio, the former being appraised at $62,000 and the latter at $32,000.

The Birmingham Iron Company, Birmingham, Ala., which was sold some time ago by Adler Brothers to H. M. Atkinson and associates of Atlanta, Ga., for over $2,000,000, has been reorganized and the following officers elected: H. M. Atkinson, president; P. S. Arkwright, vice-president, and J. H. Bonneyman, treasurer and acting manager. The company, which owns Vanderbilt Furnace and mines and mineral lands, is understood to contemplate important improvements to the property, which will include an enlargement of the stack. The new owners control the Atlanta, Birmingham & Atlantic Railroad, which is being constructed from Birmingham to Brunswick and Atlanta, Ga.

The American Steel & Wire Company is making some minor improvements to its works at Worcester, Mass. The spring mill will be extended 100 ft. A 400-ft. extension of the large insulating building and a 200-ft. extension of the smaller insulating building are being completed. The foundation is being put in for a 500-kw. Westinghouse gas engine, to operate with gas producers. At the North Works a high duty crank and flywheel Snow pump is being installed to provide high pressure water. An 800 kw. cross compound Buckeye engine to drive a Westinghouse generator will add to power facilities.

The West End Tube Works, Incorporated, McKees Rocks, Pa., is manufacturing welded tubing in sizes running from ⅝ in. to 2 in. outside diameter, and of No. 16 gauge and heavier up to 18 ft. in length. Tubing is furnished for bed manufacturers, makers of trolley poles, agricultural machinery makers and for special mechanical purposes.

E. G. Grace, superintendent of the Bethlehem Steel Company, South Bethlehem, Pa., started the first wheel in the company's new Saucon plant April 3, when he put in operation one of the large engines in the power house. Fires have been built under several boilers, and nearly all of the 26 buildings of this plant are now erected or nearing completion.

One of the Buffalo & Susquehanna Iron Company's blast furnaces at Buffalo, N. Y., which was blown out for relining February 8, resumed operations in the early part of March.

The Keystone Furnace of the Reading Iron Company, Reading, Pa., was blown out for repairs March 5. It will resume in the latter part of April.

One Crane Iron Works furnace of the Empire Steel & Iron Company, Catasauqua, Pa., was put in blast March 19, making three furnaces of that group active for the first time since October, 1906.

The five Eliza furnaces of the Jones & Laughlin Steel Company, Pittsburgh, were in blast April 1. Soho Furnace was out on that date for repairs.

One blast furnace of the Colonial Iron Company, Riddlesburg, Pa., went out of blast March 21 and was still out on April 1.

No. 1 Furnace of the Ashland Iron & Mining Company, Ashland, Ky., blew in March 23 after relining.

Cherokee Furnace of the Empire Steel & Iron Company, at Greensboro, N. C., has been dismantled.

The Steubenville Furnace of the Carnegie Steel Company, Steubenville, Ohio, was blown in March 25 after repairs.

The blast furnace of the Cleveland Furnace Company, Cleveland, Ohio, was blown out March 30.

Hamilton Furnace, Hanging Rock, Ohio, was blown out for relining March 19, and it is expected will resume early in May.

One Calumet furnace of the South Chicago Furnace Company, South Chicago, Ill., was blown out March 22. The furnace shell will be rebuilt and the furnace relined.

The furnace of the Northwestern Iron Company at Mayville, Wis., was blown out March 18.

Mary Furnace of the Ohio Iron & Steel Company, Lowellville, Ohio, was blown out for repairs in the latter part of March and will resume about April 15.

No. 3 Furnace of the Woodward Iron Company, Woodward, Ala., was blown out March 15 for relining and repairs.

General Machinery.

The Crown Worsted Mills, Providence, R. I., is to erect a machine and woodworking shop, the building to be of brick, 22 x 36 feet, and two stories.

Edgar M. Moore & Co., manufacturers' agents, 914 Farmers' Bank Building, Pittsburgh, have been appointed sole representatives in the Pittsburgh District for the Clover Leaf Machine Company of South Bend, Ind., manufacturer of the Clover Leaf concrete mixers.

The Turner-Fricke Mfg. Company, Farmers' Bank Building, Pittsburgh, Pa., will erect a new machine shop, 100 x 200 ft., at Sharon, Pa., for the manufacture of the Turner-Fricke vertical three-cylinder gas engine. The shop will be equipped with the latest machinery for the manufacture of these engines.

Power Plant Equipment.

The George G. Fetter Lighting & Heating Company, Louisville, Ky., has been incorporated, with a capital of $100,000, to take over the heating and lighting plant of the George G. Fetter Company.

The Board of Public Works, Los Angeles, Cal., will receive bids until May 6 for boilers, engines, generators and motors capable of delivering 1250 hp. electric current to the Los Angeles Aqueduct Cement Works.

The Corinth Engine & Boiler Works, Corinth, Miss., has recently shipped two carloads of machinery to Portland, Ore., and is now filling an order for six sawmills and other machinery for Texas and an order for five sawmills, eight engines and 10 boilers for Arkansas. The company increased its capital stock in January from $100,000 to $200,000.

The Southern Engine & Boiler Works, Jackson, Tenn., is now building an addition of structural steel to its boiler shop which will increase its area to 120 x 360 ft. The foundry will be removed during the coming summer to an adjacent lot on which a new building will be erected, 120 x 260 ft., equipment of which will combine the latest improvements. The business of the company is continuing to expand.

Foundries.

The Manufacturers' Foundry Company, Waterbury, Conn., has increased its capital stock from $50,000 to $100,000, the purpose being to enable the company to handle a larger business and to cover the cost of the new buildings, mention of which was made in *The Iron Age* last week.

Frank W. Tilden, Hinsdale, N. H., whose foundry buildings were seriously damaged by fire April 1, states that he will probably rebuild. The large molding room and the stack were practically all that were saved. The building destroyed served as a storehouse, drumroom, carpenters' room, shipping room and pattern room, in which many valuable patterns were stored, including a number belonging to the Granite State Mowing Machine Company.

The recently organized Keystone Steel Casting Company, Chester, Pa., has established temporary offices in rooms 39 and 40, Cambridge Building, pending the construction of its new plant, work on which will commence shortly.

It is reported that the American Car & Foundry Company is to erect a new steel foundry at its plant at St. Charles, Mo.

The Manufacturers' Foundry Company, Reading, Pa., is building an addition which will be put into operation this month. The company makes a specialty of gray iron and stove castings.

The Grey Iron Foundry & Machine Company, Reading, Pa., is to erect a new foundry, 30 x 150 ft., adjoining its present plant.

The Kankakee Foundry Company, Kankakee, Ill., has just completed an addition to its plant, which practically doubles the capacity. A new 72-in. cupola has been installed, together with other necessary equipment.

Contracts have been awarded by the Southern Skein & Foundry Company, Chattanooga, Tenn., for the construction of a large plant at East Lake. The buildings will comprise a foundry, 75 x 200 ft.; machine shop, 50 x 150 ft., two stories, and power house, 54 x 90 ft., all to be of fireproof construction.

The H. J. Hartman Foundry Company, Grand Rapids, Mich., is building an addition, 46 x 90 ft., to its present foundry, which is being constructed of cement blocks.

Work on the buildings of the Galesburg Malleable Casting Company's new plant at Galesburg, Ill., has been begun, and it is expected that they will be ready for operation within 60 days.

The Riverside Steel Casting Company, 451 to 473 Riverside avenue, Newark, N. J., made all the steam fittings used on the boilers of the new steamboats Yale and Harvard built by the W. & A. Fletcher Company, Hoboken, N. J., for the Maine Steamship Company. The Riverside Company is just entering the third year of its business career and has gained a reputation for its crucible steel castings through its excellent workmanship and exceptional deliveries.

The plant of the Sheffield Castings & Mfg. Company, Sheffield, Ala., is now in full operation.

The addition, 130 x 250 ft., which is to be built to the plant of the Industrial Works, Bay City, Mich., will be used as a foundry for the manufacture of iron and steel castings, for which an entire equipment will be purchased.

Fires.

On March 28 the shops of the Nevada Central Railroad at Battle Creek, Mich., were destroyed by fire.

The plant of the Shamokin Wagon Company, Shamokin, Pa., was badly damaged by fire April 2.

The fertilizer plant of the Western Packing Company, Denver, Colo., was recently destroyed by fire. The loss is placed at $3000.

The engineering building of McGill University, Montreal, Canada, was destroyed by fire April 5. The loss will reach $500,000.

The brass foundry of the J. G. Brill Company, Philadelphia, Pa., was damaged $10,000 by fire April 5.

The power house of the San Francisco Gas & Electric Light Company, San Francisco, Cal., was destroyed by fire April 3, the loss being estimated at about $2,000,000.

The car barns and power house of the Metropolitan Street Railroad, New York, were badly damaged by fire April 8.

One of the large buildings in the League Island Navy Yard, Philadelphia, Pa., containing the sawmill, joiner shop and pattern shop, was almost completely destroyed by fire April 9. The loss is estimated at $70,000.

Hardware.

The R. W. Whitehurst Company, Norfolk, Va., reports a very satisfactory condition of business. While behind on orders, as has been the case for the past three years, with the completion of its new plant some time since the company is in better position than heretofore to look after the requirements of its customers. The main building of the plant is 72 x 410 ft., the foundry 72 x 210 ft. and wareroom 60 x 110 ft. The blacksmith shop, pattern storage room, painthouse and all of the smaller buildings are detached. The buildings are brick and have steel truss roofs. A railroad track in the yard accommodates eight cars, so that goods can be loaded from the wareroom to the car and shipped to any part of the country. Every department has been equipped with the latest improved machinery, and the company is now able to turn out about four times as many goods as heretofore. Its specialties are Boss rollers, Handy stepladders, hose reels, fruit presses and a full line of small hand trucks.

The Norton Company, Worcester, Mass., and Niagara Falls, N. Y., manufacturer of grinding wheels made of alundum, is to erect a large addition to its Worcester works. The building will be 100 x 200 ft. and three stories, and will constitute an extension to what is known as plant No. 2 of the main works at Worcester. Seven kilns will be built in connection with the new building. The addition is one of the largest that has been made to the works for some time and will permit of a large increase in output, which has become necessary because of the very rapid growth of the business of the company.

Miscellaneous.

The Struthers Coal & Coke Company, which now has 168 ovens in operation in the Connellsville region, is adding 32 more, which will be ready in a short time. This company is owned by the Struthers Furnace Company, operating a blast furnace at Struthers, Ohio, of which W. C. Runyon is president, George L. Fairbank vice-president, and A. Grossman secretary and treasurer.

The Excelsior Roofing Company, Fultonville, N. Y., has purchased a tin shop and roofing business, which it will enlarge. The company is in the market for roofing of all kinds, galvanized iron and punching machinery.

Marks Lissberger & Son, Incorporated, have removed their smelting and refining works from Brooklyn to 81 Borden avenue, Long Island City. It is their desire that for the present all mail should be sent to the New York office, 393 West Twelfth street.

The Siro-Carburetor Mfg. Company, Springfield, Mass., has been incorporated with a capital stock of $30,000, to manufacture a new carburetor. It is the plan of the company to begin manufacturing by having much of the work done by outside parties, but the hope is expressed that in another year a factory will be established. For the present a small establishment for assembling and finishing the device will be all that is required. F. W. Sickles, Hartford, Conn., is president; W. A. Burnham, Springfield, vice-president, and S. J. Rosenfeld, Springfield, secretary and treasurer.

The Cutler-Hammer Mfg. Company, New York, has been incorporated with a capital stock of $50,000, to take over the plant in that city of the Cutler-Hammer Mfg. Company, Milwaukee, Wis. No change in management or additions are contemplated. The company manufactures electric controlling devices.

The Canton Brass Company, Canton, Ohio, has placed its foundry in operation and in about two weeks will start up its machine shop. The company will make a full line of brass goods for steam use, specialties in automobile work, and will do general foundry and machine work in brass, bronze and aluminum.

The Pittsburgh Automatic Vise & Tool Company, Pittsburgh, has recently made a large shipment of double swivel vises to Cologne, Germany. This company is making regular foreign shipments of these vises and is constantly receiving inquiries from abroad.

The plant of the Sterlingworth Railway Supply Company, Easton, Pa., was placed in operation April 4 under the receivership of William J. Kuedler. Charles James of Berwick, Pa., is manager.

The John O. Stivers Electrical Company, 724 Nineteenth street, Denver, Colo., has been incorporated with a capital stock of $100,000, to manufacture the Stivers electric duplicating fuse box and switch. While the company's offices will remain in Denver it is probable that the plant will, for the sake of economy in manufacture, be established in some Eastern city.

Henry T. Burns has been appointed receiver for the Richmond City Mill Works, Richmond, Ind., manufacturer of flour mill machinery. The plant has temporarily suspended operations, but an early resumption of work is predicted.

A charter has been granted the Schuylkill Haven Iron & Steel Company, which will handle iron and steel products at Schuylkill Haven, Pa. The incorporators are Elbert Williamson, John W. Russel and George A. Maene, Philadelphia.

The Miller Non-Corrosive Metal Company has been incorporated to manufacture certain compounds in Pittsburgh. The incorporators are F. L. O. Wadsworth, Sewickley; Edwin K. Morse, Pittsburgh, and L. Hays Gott, Allegheny.

The Chattanooga Roofing & Foundry Company, Chattanooga, Tenn., is installing machinery to manufacture metal ceilings, and will soon issue to the trade an illustrated catalogue showing entirely new designs. It reports the demand for its New Century shingles as increasing daily.

The Folding Mattress Company, 79181 Goffe street, New Haven, Conn., is in the market for a feather crusher and curling mill, which it wishes to get immediately.

The Fedders Mfg. Company, Buffalo, N. Y., manufacturer of automobile radiators and metal specialties, is erecting a three-story brick factory building on Tonawanda street at a cost of $30,000.

Rice & Adams, Buffalo, N. Y., manufacturers of dairy machinery, are putting up a new factory building of concrete block construction on Chandler street and the New York Central Belt Line.

The plant and other assets of the Niagara Radiator Company, North Tonawanda, N. Y., have been ordered sold May 18 by the referee in bankruptcy. The total value of the property, according to the schedule, is about $440,000, of which $220,000 represents the value of the plant. It will be clear of all liens and indebtedness except $32,000 in unpaid bonds, which are secured by a trust mortgage.

The Hayes-Run Fire Brick Company, Orvis, Pa., has just completed a 75-ft. addition to the main building and the installation of four new kilns. The increased demand for the company's products necessitated the enlargement of the plant, and it is now in a position to fill orders more promptly than in the past.

The Wolf Mfg. Company, Scranton, Pa., manufacturer of mill supplies, has been placed in the hands of a receiver. The liabilities are estimated at from $500,000 to $750,000. The company has outstanding $350,000 of stock, and in addition has a bonded debt of $150,000. Walter K. Sharfe of Chambersburg, Pa., has been appointed receiver.

The Zephyr Ventilator & Mfg. Company, Philadelphia, has taken over the plant and equipment of the National Tool & Stamping Company, located at Wayne Junction in that city, and in addition to the manufacture of the Zephyr ventilator and the Philadelphia Radial lamp holder will continue to make the line of special machinery, stampings, forgings and die work heretofore done by the National Company. The present equipment of the Zephyr Company will be moved to the Wayne Junction plant, the added equipment enabling it to materially increase the present output in all its various lines. Howard E. Wilson, formerly with E. H. Wilson & Co., Philadelphia, is secretary and treasurer of the corporation, while William F. Fillman, formerly with William Sellers & Co. and the Lanston Monotype Machine Company, and who has had a large experience in die work, has been appointed general superintendent.

The Society of Automobile Engineers, of which Edward T. Birdsall, 82 East avenue, Rochester, N. Y., is secretary-treasurer, calls attention to the following definition which it has adopted and which forms Article 1 of its constitution: "The term 'automobile,' as used by this society, is intended to cover any self-propelled vehicle operating on or under the surface of the earth or water, or in the air." With this definition, and its freedom from any connection or affiliation with any other association, the society is made one of the broadest in scope and most independent.

The Iron and Metal Trades

The March product of the coke and anthracite blast furnaces was 2,225,175 tons, as compared with 2,045,068 tons in February, a short month, and 2,235,306 tons in the record month, December. While on the face of it this looks as though March had been larger than February, as a matter of fact the daily rate of production in March was only 71,780 tons, as compared with that of 73,038 tons for February. This decline, due to floods and to the blowing out of furnaces, chiefly affected the steel works furnaces, the merchant furnaces having run along during the past three months at a practically uniform gait. The weekly capacity of the furnaces in blast on April 1 was 497,456 tons, as compared with 511,035 tons on the first of March. This indicates a moderate falling off in the output during the current month.

Very large and important transactions have taken place in Pittsburgh in Bessemer Pig, the total figuring up well above 250,000 tons. The Bessemer Pig Iron Association has sold to the Youngstown Sheet & Tube Company 10,000 tons of June Iron, which cleans up the supply for that month, and has sold to the same plant 150,000 tons for the second half at $21, at furnace.

W. P. Snyder & Co. have sold an aggregate of 100,000 tons, a part of it for the second quarter, but the bulk of it for the second half.

Outside of a considerable inquiry from a Cast Iron Pipe maker, there has been little demand for Foundry Iron in the West, and the principal distributing points represent the market as being quiet, with an undertone of strength for the second and third quarter.

In the East irregularity has developed in the prices quoted. There are some good inquiries, but the figures named on some of the larger contracts indicate that some sellers are somewhat more eager than they were.

Additional cargoes of Middlesbrough Iron have been engaged, as has also one cargo of Scotch Iron. A good deal of foreign Iron is being worked off Westward because the conditions for placing the Iron are more favorable there than on the seaboard. The markets abroad have stiffened considerably since last week, and Middlesbrough has advanced from 53 shillings 2 pence to 55 shillings 4 pence. Middlesbrough is selling here at $20.50 to $21, ex ship.

The scarcity of Steel in the Central West continues for early delivery, and at a price a good deal of tonnage could be placed there. Nothing, however, has been done.

The chief transactions in the Rail market have been the purchase of 10,000 tons for the Chicago City Railway and 10,000 tons for the Union Traction Company of Chicago from the Lorain Works. There have been sales aggregating 7000 tons for export to China and Japan.

The principal event in the Structural trade has been the placing of an order with the American Bridge Company for the Havre de Grace bridge, calling for 15,000 tons. About 5000 tons of Structural Material was sold for the Pacific Coast, including 3300 tons for San Francisco. A good deal of Structural Material is coming up. Included in this work are 7000 to 10,000 tons for the Jones & Laughlin bridge at their new plant, 9000 tons for new Pullman shops, 7000 tons for the 'Frisco bridge over the Mississippi at Chafee, Ark., and 4500 tons for the Corn Exchange Bank at Chicago.

Private advices here from the best sources on the other side give the most positive assurances that the German Steel syndicate will be renewed.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Apr.10, 1907.	Apr.3, 1907.	Mar.13, 1907.	Apr.11, 1906.
PIG IRON, Per Gross ton:				
Foundry No. 2, Standard, Philadelphia	*$24.50*	$24.50	$25.25	$18.50
Foundry No. 2, Southern, Cincinnati	*24.75*	26.00	26.00	16.50
Foundry No. 2, Local, Chicago	**26.00**	26.00	25.50	18.75
Bessemer, Pittsburgh	**23.35**	22.85	22.85	18.10
Gray Forge, Pittsburgh	*21.60*	21.60	21.85	16.60
Lake Superior Charcoal, Chicago	*26.50*	26.50	27.00	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	**30.00**	30.00	29.00	27.00
Forging Billets, Pittsburgh	36.00	36.00	36.00	32.00
Open Hearth Billets, Phila	*31.50*	31.50	33.00	29.00
Wire Rods, Pittsburgh	37.00	37.00	37.00	34.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross ton:				
Steel Rails, Melting, Chicago	**18.50**	18.00	18.00	13.50
Steel Rails, Melting, Phila	*18.75*	19.00	19.25	17.00
Iron Rails, Chicago	25.00	25.00	25.00	20.50
Iron Rails, Philadelphia	27.00	27.00	27.00	21.50
Car Wheels, Chicago	**25.00**	25.00	24.00	19.00
Car Wheels, Philadelphia	**24.00**	24.00	23.25	16.75
Heavy Steel Scrap, Pittsburgh	18.00	18.00	18.00	14.50
Heavy Steel Scrap, Chicago	16.00	16.00	16.00	13.50
Heavy Steel Scrap, Philadelphia	*18.50*	18.75	19.00	16.50
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.93½	1.93½	1.93½	1.63½
Common Iron Bars, Chicago	1.81½	1.81½	1.81½	1.66½
Common Iron Bars, Pittsburgh	1.80	1.80	1.80	1.60
Steel Bars, Tidewater, New York	1.74½	1.74½	1.74½	1.64½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.50
Tank Plates, Tidewater, New York	1.84½	1.84½	1.84½	1.74½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.60
Beams, Tidewater, New York	1.84½	1.84½	1.84½	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.84½	1.84½	1.84½	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.90	1.90	1.90	1.57½
Skelp, Sheared Steel, Pittsburgh	2.00	2.00	2.00	1.60
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.50	2.50	2.50	2.25
Wire Nails, Pittsburgh	2.00	2.00	2.00	1.85
Cut Nails, Pittsburgh	2.05	2.05	2.05	1.80
Barb Wire, Galv., Pittsburgh	2.45	2.45	2.45	2.30
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	*24.50*	24.50	25.50	18.62½
Spelter, New York	*6.85*	6.85	6.95	6.00
Spelter, St. Louis	*6.65*	6.65	6.80	5.90
Lead, New York	*6.15*	6.25	6.35	5.35
Lead, St. Louis	*5.95*	6.05	6.10	5.25
Tin, New York	*40.85*	40.00	42.25	38.55
Antimony, Hallett, New York	*22.25*	23.00	23.50	19.50
Nickel, New York	45.00	45.00	45.00	40.00
Tin Plate, 100 lb., New York	$4.09	$4.09	$4.09	$3.79

Chicago.

FISHER BUILDING, April 10, 1907.—(*By Telegraph.*)

Although there is nothing to indicate that consumers are any less anxious than heretofore for the full completion of all contracts for finished material, it is nevertheless true that there is some falling of in the development of forward business, especially in lines involving long deferred deliveries. The demand for Steel Bars and Structural Material continues strong and a growing scarcity of Merchant Pipe is reported. The large number of inquiries for Structural Steel coming from the Western mining districts give promise of future orders for considerable tonnage from that source. Prices are firmly held in practically all lines and premiums are still paid for prompt shipments of some of the more congested products. From the consumers' point of view, the Pig Iron situation has been greatly improved by the receipt of shipments on long overdue orders. Melters are now generally well supplied for current wants and exhibit very little interest in the market for forward delivery. The feeling among buyers seems to be that last half prices will not be higher than they now are and may possibly be lower. Sellers in the meantime are not making advances to induce buyers to take hold and the result is an extremely quiet market. How soon the present waiting game will end, or with what result, it would be hazardous to predict, but a renewal of activity cannot be expected as long as the opposing interests maintain their present unyielding attitude.

Pig Iron.—Extreme quietness prevails in the market. The demand for spot Iron, which, through the entire first quarter was very active, has been sharply curtailed by recent free receipts from Southern furnaces. Car service from those points is steadily improving, with the result that the urgent need of material by melters has been greatly relieved. Iron due for shipment as far back as October and November

of last year is just now coming in. In consequence many foundries that three weeks ago were paying high prices for spot shipments now have surplus stocks. Transactions for any delivery are scattering and involve tonnages of small importance. Very little interest is shown by consumers in second-half requirements, this being especially true of fourth quarter engagements. The market is practically barren of inquiries that indicate a firm purpose to buy for extended deliveries. Despite the meagerness of business offered, prices are still firmly maintained by furnace interests, both North and South. No quotations better than $18.50 Birmingham, for No. 2 Foundry are now reported by representatives in this market, the price of $18 heretofore named by one interest having this week been withdrawn. The same spread in prices asked by the various furnaces still exists and represents the differences of opinion as to the future strength of the market. Iron from the Virginia District is offered at $23 for second quarter and $21 for last half at furnace. Northern furnaces are closely sold up and are not disposed to make concessions on the unplaced tonnage at their disposal. The following quotations are for April, May and June shipments, f.o.b. Chicago:

Lake Superior Charcoal	$26.50 to $27.00
Northern Coke Foundry, No. 1	26.50 to 27.00
Northern Coke Foundry, No. 2	26.00 to 26.50
Northern Coke Foundry, No. 3	25.50 to 26.00
Northern Scotch, No. 1	26.00 to 27.00
Ohio Strong Softeners, No. 1	26.00 to 26.50
Ohio Strong Softeners, No. 2	25.50 to 26.00
Southern Coke, No. 1	26.35 to 27.10
Southern Coke, No. 2	25.85 to 26.35
Southern Coke, No. 3	25.35 to 25.85
Southern Coke, No. 4	24.85 to 25.35
Southern Coke, No. 1 Soft	26.35 to 26.85
Southern Coke, No. 2 Soft	25.85 to 26.35
Southern Gray Forge	21.85 to 22.35
Southern Mottled	21.85 to 22.35
Malleable Bessemer	26.50 to 27.00
Standard Bessemer	25.30 to 25.80
Jackson Co. and Kentucky Silvery, 6 %	30.30 to 30.80
Jackson Co. and Kentucky Silvery, 8 %	32.30 to 32.80
Jackson Co. and Kentucky Silvery, 10 %	34.30 to 34.80

Metals.—Notwithstanding the softening of Copper prices reported in foreign markets, local holders of metal stocks still maintain prices on both Casting and Lake Copper at about the same level as last reported. Buying is restricted to immediate needs and the volume of trade of this character is fair. Sheet Zinc is advanced 10c. on the list. No change is noted in old metals. We quote as follows: Casting Copper, 26½c. to 27c.; Lake, 27c. to 27½c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 43c.; small lots, 43¾c.; Lead, Desilverized, 6.50c. to 6.60c., for 50-ton lots; Corroding, 7.25c. to 7.35c., for 50-ton lots; on car lots, 2¼c. per 100 lb. higher; Spelter, 7¼c.; Cookson's Antimony, 28½c., and other grades, 26½c. to 27½c.; Sheet Zinc is $8.60 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 19c.; Heavy Copper Wire, 19c.; Copper Bottoms, 18c.; Copper Clips, 18½c.; Red Brass, 18½c.; Red Brass Borings, 16½c.; Yellow Brass, 15¼c.; Yellow Brass Borings, 13¾c.; Light Brass, 12½c.; Lead Pipe, 5.25c.; Tea Lead, 4¾c.; Zinc, 4¾c.; Pewter, No. 1, 25c.; Tin Foil, 31½c.; Black Tin Pipe, 27½c.

(By Mail.)

Billets and Rods.—The supply of Rods continues short of the demand on all grades. Forging Billets are also scarce, and transactions are restricted to small tonnage lots, but quotations are unchanged at $38, Chicago, and upward, according to size.

Rails and Track Supplies.—No nearby deliveries on Light Rails can be had from the principal Western mills, and but little new business is offered for forward bookings. For Track Supplies accompanying Rail orders prices are a little softer, and quotations on Spikes and Bolts are revised. For prompt shipment, however, from 10c. to 15c. above quotations are realized. We quote as follows: Angle Bars, accompanying Rail orders, 1907 delivery, 1.65c.; car lots, 1.90c. to 1.95c.; Spikes, 2.35c. to 2.45c., according to delivery; Track Bolts, 2.65c. to 2.75c., base, Square Nuts, and 2.80c. to 2.90c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 30 to 45 lb. sections, $35; 25-lb., $36; 20-lb., $37; 16-lb., $38; 12-lb., $39, f.o.b. mill. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—Specifications continue to come forward without restraint, and the mills are reported to be fully engaged. An unusually large number of inquiries have lately been received from mining interests throughout the West, and indications point to a large tonnage from other sources. Significant of the great activity in Structural work is the statement of the American Bridge Company that last week's business was the largest ever recorded in its history. Bids on 9000 tons for the new buildings at the Pullman Car Company's works will soon be asked, and plans for the Corn Exchange Bank requiring 4500 tons will within a short time be ready for figures. A new bridge for the 'Frisco Railroad over the Mississippi at Chafee, Ark., will take 7000 tons, for which figures will be asked in the near future. Prices from store are quoted without change, at 2.05c. to 2.10c., and mill prices are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.86½c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.86½c.; larger than 6 in. on one or both legs, 1.96½c.; Beams, larger than 15 in., 1.96½c.; Zees, 3 in. and over, 1.86½c.; Tees, 3 in. and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending and other shop work.

Plates.—While the volume of new business developing is not as great as heretofore, there are enough orders offered to keep all available mill capacity well supplied with specifications. Prices asked for nearby deliveries still hold about the same advance above the nominal quotation of 1.70c. Pittsburgh, ranging from $1 to $4 per ton over that price, according to specifications and shipment required. We quote for future delivery as follows: Tank Plate, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.86½c. to 2.06½c.; 3-16 in., 1.96½c. to 2.16½c.; Nos. 7 and 8 gauge, 2.01½c. to 2.21½c.; No. 9, 2.11½c. to 2.31½c.; Flange quality, in widths up to 100 in., 1.96½c. to 2.06½c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.96½c. to 2.16½c.; Flange quality, 2.06½c. Store prices on Plates are as follows: Tank Plate, ¼-in. and heavier, up to 72 in. wide, 2.20c. to 2.30c.; from 72 to 96 in. wide, 2.30c. to 2.40c.; 3.16 in., up to 60 in. wide, 2.30c. to 2.40c.; 72 in. wide, 2.55c. to 2.65c.; No. 8, up to 60 in. wide, 2.35c. to 2.45c.; Flange and Head quality, 0.25c. extra.

Sheets.—Little or no progress is reported in mill efforts to relieve the congestion complained of in all kinds of Sheets. The amount of new business offered, while fair, would doubtless be much greater if it were possible to get shipments within a reasonable time. We quote as follows: Blue Annealed, No. 10, 2.01½c.; No. 12, 2.06½c.; No. 14, 2.11½c.; No. 16, 2.21½c.; Box Annealed, Nos. 17 to 21, 2.51½c.; Nos. 22 to 24, 2.56½c.; Nos. 25 and 26, 2.61½c.; No. 27, 2.66½c.; No. 28, 2.76½c.; No. 29, 2.86½c.; No. 30, 2.96½c.; Galvanized Sheets, Nos. 10 to 14, 2.81½c.; Nos. 15 and 16, 3.01½c.; Nos. 17 to 21, 3.16½c.; Nos. 22 to 24, 3.31½c.; Nos. 25 and 26, 3.51½c.; No. 27, 3.71½c.; No. 28, 3.91½c.; No. 30, 4.41½c.; Sheets from store: Blue Annealed, No. 12, 2.30c.; No. 14, 2.35c.; No. 16, 2.45c.; Box Annealed, Nos. 18 to 21, 2.70c.; Nos. 22 to 24, 2.75c.; No. 26, 2.80c.; No. 27, 2.85c.; No. 28, 2.95c.; No. 30, 3.35c.; Galvanized from store: Nos. 10 to 20, 3.30c. to 3.35c.; Nos. 22 to 24, 3.55c. to 3.60c.; No. 26, 3.65c. to 3.70c.; No. 27, 3.85c. to 3.95c.; No. 28, 4.15c.; No. 30, 4.65c. to 4.70c.

Bars.—No hesitation is shown in the steady stream of specifications that continue to pour in for Steel Bars, and prices are firmly held. Some contracts for the last half of the year are being made by agricultural interests, though the movement to cover for requirements for this period is by no means general. Iron Bars are quieter and it is reported that the currently quoted price of 1.81½c., Chicago, is being shaded $1 a ton. Other quotations are as follows: Steel Bars, 1.76½c., with half extras; Hoops, 2.16½c., extras as per Hoop card; Bands, 1.76½c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.86½c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—In no department of Finished Material is the demand more persistent than in Merchant Pipe. With the renewal of activity in building operations, the increasing demand for small sizes has produced an unusual scarcity in sizes up to 4 in. Quite a number of orders are being booked by the National Tube Company, at prices to be named after June 1, before which date no shipments of present bookings are promised. Local mills report no change in prices, which on the base sizes are reported as follows: Black Steel Pipe, ¾ to 3 in., 72.35; Galvanized, 62.35, carload lots, Chicago. From store in small lots, Chicago jobbers quote 70 per cent. on Black Steel Pipe, ¾ to 6 in. About 4 points advance above these prices is asked for Iron Pipe.

Boiler Tubes.—But little variation from the market as reported last week is noticed in mill conditions or demand. There is perhaps a little less new business developing, but the pressure for belated orders has not abated. Mill quotations on the base sizes are nominally as follows: 2¾ to 3 in., in carload lots, Steel Tubes, 63.35; Iron, 50.35; Seamless, 49.35; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in	35	35	35
1¾ to 2¼ in	50	35	35
2½ in	52½	35	35
2¾ to 5 in	60	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—Jobbers are specifying freely on contracts, and prompt shipment of Tire sizes is being urged. There is a fair demand for Shafting, on which deliveries are from three to four weeks behind. Prices are unchanged and are as follows: Planished or Smooth Finished Tire Steel, 1.96½c.; Iron Finish, up to 1½ x ½ in., 1.91½c.; Iron Finish, 1½ x ½ in. and larger, 1.76½c., base; Channels for solid rubber Tires, ¾ to 1 in., 2.26½c., and 1⅛-in. and larger, 2.16½c.; Smooth Finished Machinery Steel, 2.16½c.; Flat

Sleigh Shoe, 1.91½c.; Concave and Convex Sleigh Shoe, 2.06½c.; Cutter Shoe, 2.45c.; Toe Calk Steel, 2.31½c.; Railroad Spring, 1.96½c.; Crucible Tool Steel, 6½c. to 8c., and still higher prices are asked on special grades. Shafting, 50 per cent. off in car lots and 45 per cent. in less than car lots, base territory.

Cast Iron Pipe.—Lettings involving large tonnages are few, orders being mainly for lots of a few hundred tons required for extensions and maintenance. Bids are being received by the city of Portland, Ore., for 2600 tons. The contract for 2500 tons let by Salt Lake City was secured by the United States Cast Iron Pipe & Foundry Company. We quote per net ton as follows: Water Pipe, 4-in., $38 to $39; 6 to 12 in., $37 to $38; 16-in. and up, $36 to $37, with $1 extra for Gas Pipe.

Coke.—Some season contracts are being placed, and the current foundry demand is fair. Connellsville 72-hr. Coke per car lot at ovens, for prompt shipment, is quoted at $3.50 to $3.75; Solvay Coke, $6.75, Chicago, prompt delivery.

Old Material.—There 's quite a marked variation in the views of the different Scrap interests as to prices. Indications pointing to freer buying by the mills are noticed and some stiffening of prices has resulted, but the upward movement is not positive enough to warrant much emphasis. While on Old Steel Rails, 3 ft. and over, quotations have been advanced to $19, on strength of spot purchases, rerollers for May and June delivery are offered at $18.50. Cast Scrap prices still remain firm, though on account of freer shipments of Pig Iron the demand is slackening somewhat. Railroad offerings this week amount to a total of 10,000 tons, distributed as follows: Chicago, Rock Island & Pacific, 1800 tons; Chicago & Eastern Illinois, 600 tons; Chicago, Milwaukee & St. Paul, 1640 tons; Baltimore & Ohio, 5500 tons; Wisconsin Central, 500 tons. The following quotations are per gross tons, f.o.b. Chicago:

Old Iron Rails	$25.00 to $26.00
Old Steel Rails, 3 ft. and over	19.00 to 19.50
Old Steel Rails, less than 3 ft.	18.50 to 19.00
Relaying Rails, standard sections, subject to inspection	31.00 to 32.00
Old Car Wheels	25.00 to 25.50
Heavy Melting Steel Scrap	16.00 to 16.50
Frogs, Switches and Guards	16.50 to 17.50
Mixed Steel	12.50 to 13.00

The following quotations are per net ton:

Iron Fish Plates	$19.50 to $20.50
Iron Car Axles	26.50 to 27.00
Steel Car Axles	21.00 to 21.50
No. 1 Railroad Wrought	15.50 to 16.00
No. 2 Railroad Wrought	14.75 to 15.25
Railway Springs	15.00 to 15.50
Locomotive Tires, smooth	17.00 to 17.50
No. 1 Dealers' Forge	12.00 to 12.50
Mixed Busheling	11.00 to 11.50
Iron Axle Turnings	11.50 to 12.00
Soft Steel Axle Turnings	11.50 to 12.00
Machine Shop Turnings	11.50 to 12.00
Cast Borings	9.25 to 9.75
Mixed Borings, &c.	9.00 to 9.50
No. 1 Mill	10.00 to 10.50
No. 2 Mill	9.00 to 9.50
No. 1 Boilers, cut to Sheets and Rings	11.50 to 12.00
No. 1 Cast Scrap	19.00 to 20.00
Stove Plate and Light Cast Scrap	15.00 to 15.50
Railroad Malleable	16.50 to 17.00
Agricultural Malleable	15.00 to 16.00

Birmingham.

BIRMINGHAM, ALA., April 7, 1907.

Pig Iron.—The only thing of unusual interest affecting the Iron market this week is the improvement in the transportation situation. The congestion which has prevailed in all the railroad yards here for several months is rapidly disappearing, and cars are more plentiful than for a long while. This has enabled producers to move a large percentage of the accumulation of Pig Iron, an authority placing the stock in the Birmingham District to-day at 27,000 tons. This will also be moved within the next few weeks, and in a very short time furnaces will again be loading directly from cast sheds into cars. Buying continues about the same as during the past two or three weeks, and while orders are usually for small tonnage some interests report sales exceeding current production. So far as can be ascertained, the market is fully as firm to-day as at any time during the year, and some of the Iron men claim that if there is any difference it is stronger. Prices range about as follows: April shipment, $22.50; May and June, $21.50 to $22; third quarter, $18.50 to $19, and last quarter, $18.50. All the furnaces, with but one exception, are now asking $19 for third quarter for Southern delivery, this interest stating that the tonnage for that delivery still remaining is very small. Some of the favorite brands have been withdrawn from the market for the year, the estimated production having already been sold. It is now thought that the furnaces in Alabama will be able to increase present production but little, if any, during the present year. When the stacks now undergoing repairs are blown in, others will be put out, and besides, the development in the ore mines has not been sufficient to furnish enough raw material to operate additional stacks, even should the physical condition of the furnaces permit their being worked. When the slight effect that the unsettled condition of the stock market has had on the Iron market, the large percentage of the production for the balance of the year under contract, the abnormal demand for Iron, the general prosperity of the country, and the prospect for good crops this year are all taken into consideration, it is hard to see how there is likely to be a decline in prices for several months to come.

Cast Iron Pipe.—Cast Iron Soil Pipe is finding ready sale at the advanced prices. Inability to secure sufficient molders is restricting production here from 40 to 50 per cent., and it is only with the greatest efforts that the foundries in this district are handling the business offered. Under normal conditions manufacturers carry stocks which enable them to fill orders on contracts for assorted carload shipments within not exceeding 10 days from receipt of specifications, but at the present time 30 to 60 days is considered prompt shipment. Inquiries for Cast Iron Water Pipe in lots of 500 tons and less continue in great number, but the larger buyers are not in the market at present. Foundries here as a rule are booked for their entire production to July, and sales now being made are for delivery after that date. Quotations on Water Pipe per net ton are as follows: 4 to 6 in., $35; 8 to 12 in., $33; over 12-in., average, $31, with $1 per ton extra for Gas Pipe.

Old Material.—Practically no change is reported in the Scrap market this week. Cast Scrap continues in good demand, but on other grades the market is dull. Dealers' quotations are approximately as follows per gross ton, f.o.b. cars here:

Old Iron Rails	$22.00 to $22.50
Old Iron Axles	18.50 to 19.00
Old Steel Axles	16.50 to 17.00
Old Car Wheels	20.50 to 21.00
No. 1 Railroad Wrought	19.00 to 19.50
No. 2 Railroad Wrought	13.50 to 14.00
No. 1 Country Wrought	13.50 to 14.00
No. 2 Country Wrought	12.00 to 12.50
Wrought Pipe and Flues	13.50 to 14.00
Railroad Malleable	13.00 to 13.50
No. 1 Steel	14.00 to 14.50
No. 1 Machinery Cast	16.00 to 16.50
Stove Plate and Light Cast	12.50 to 13.00
Cast Borings	8.50 to 9.00

Pittsburgh.

PARK BUILDING, April 10, 1907.—(*By Telegraph.*)

Pig Iron.—In the last few days there has been heavy buying of Bessemer Iron for second quarter delivery, but mostly for the last half, the total sales thus made aggregating nearly 250,000 tons. The largest buyer is the Youngstown Sheet & Tube Company, which has bought from the Bessemer Pig Iron Association 10,000 tons for June at $22 Valley furnace, and 150,000 tons for last half delivery, at $21, Valley furnace. The company has an arrangement by which it gets upward of 15,000 tons per month from blast furnaces in the Mahoning Valley in addition to about 250 tons a day made by its Alice Furnace at Sharpsville, Pa. The 150,000 tons, deliveries on which will be 25,000 tons per month, July to December, is additional Iron that the company will use in its Bessemer plant at Youngstown. The purchase thus made takes practically all the surplus Iron the Bessemer Pig Iron Association will have for second half delivery. In addition, W. P. Snyder & Co. have sold for second quarter, but mostly for last half delivery, about 100,000 tons of Bessemer Iron, part of the tonnage going to the Allegheny Steel Company, Sharon Steel Hoop Company, and Page Woven Wire Fence Company, the larger part of the tonnage going to a prominent Steel interest for second half. All this Iron was sold by W. P. Snyder & Co., without a definite price being fixed, the average price per month to determine the cost of the Iron to the buyers. These sales, aggregating 250,000 tons for last half, leave very little unsold Iron by either of these large producers for that period, and firmly establish the Bessemer Pig Iron market for last half of the year at $21 or higher. They are bound to have a good effect on the whole Iron trade, and will do much to fix the present satisfactory condition of the Steel trade for the balance of this year. The absolute minimum of the market in Bessemer Iron for second quarter is $22.50, and it is probable that $23 would have to be paid to bring out any tonnage. We note additional sales of 6000 to 8000 tons of Bessemer for second quarter at $22.50, Valley furnace, 2000 tons for second quarter at $23, and scattering sales of probably 3000 tons for April delivery, at $23 at furnace. We note a fairly active demand for Foundry Iron, Northern No. 2 for April delivery having been sold at $24 to $25 for second quarter, $23 to $24 for third quarter, and for last half of the year delivery, $22 to $23, Valley furnace. Some prominent sellers of Foundry Iron will not shade the higher prices, and are entering tonnage right along at these figures. The inquiry for Forge Iron is quiet, but the market is fairly firm on the basis of $20.75 to $21, Valley furnace, or $21.60 to $21.85, Pittsburgh.

Steel.—It is almost impossible to get Bessemer or Open Hearth Billets for early delivery at any price, a sale of 1000

tons of 4 x 4 in. Bessemer Billets for early delivery being reported on the basis of about $30.50, Pittsburgh. We quote Bessemer Billets at $30 to $30.50, and Open Hearth Billets at $31 to $31.50, f.o.b. Pittsburgh. Sheet and Tin Bars on contracts are $30 to $31 for prompt delivery, $31 and even higher being now quoted.

(*By Mail.*)

A feature of the market is the active demand for Bessemer, Malleable Bessemer and Basic Pig Iron for second quarter delivery. The available tonnage is light, and, in fact, Bessemer or Basic Iron for shipment prior to July is hard to obtain. Two of the leading local producers are out of the market as sellers, and only small lots can be picked up. There is a moderate inquiry for Foundry Iron for both prompt and second quarter delivery, and we also note that some tonnage has been sold for second half of the year delivery on the basis of $22 at Valley furnace. It may be stated that the whole Pig Iron market is as strong at the present moment as at any time this year, and the market seems to have largely recovered from the recession in prices which occurred early in March. As regards Steel, it is almost impossible to buy Bessemer or Open Hearth Billets for early delivery at any price. The Carnegie Steel Company has already bought a large tonnage of Open Hearth Billets from outside works, and would probably buy additional tonnage in either Bessemer or Open Hearth if it could be had. In Finished Iron and Steel the situation is satisfactory from every point of view, despite pessimistic reports in the daily press of impending disaster to the Steel trade.

Ferromanganese.—Prices are erratic, and the market is difficult to gauge. We noted last week's sales of Ferro for last half of the year delivery at less than $67, and reports are now that foreign 80 per cent. Ferro for shipment over second half is being offered at $65, delivered, or less. For prompt shipment anywhere from $72 to $75, Pittsburgh, is being quoted, but it is probable that on a firm offer 80 per cent. foreign Ferro for April and May delivery could be bought freely at $72, and perhaps less.

Muck Bar.—There is some inquiry in the market, with the available supply limited. We quote best grades made from all Pig Iron at $37 to $37.50, Pittsburgh, and a sale is reported of about 650 tons at about $37, delivered, Pittsburgh. Muck Bar, made from part Scrap, is held at $33 to $34, Pittsburgh.

Rods.—Both Bessemer and Open Hearth Rods for early delivery are almost impossible to obtain and are held at $37 to $38, Pittsburgh. It is stated that on a small tonnage of Rods for prompt shipment upward of $39, Pittsburgh, has been paid.

Skelp.—Inquiries are in the market from a large consumer for a heavy tonnage of Iron Skelp in Sheared and Grooved sizes, but so far the tonnage has not been placed, as none of the mills rolling Skelp is in position to make the deliveries wanted. It is practically impossible to get any Skelp for delivery before July. We quote: Grooved Steel Skelp, 1.90c. to 1.95c.; Sheared Steel Skelp, 2c. to 2.05c.; Grooved Iron Skelp, 2.15c.; Sheared Iron Skelp, 2.25c., all f.o.b. Pittsburgh.

Steel Rails.—During the past week the Carnegie Steel Company took contracts for about 10,000 tons of Standard Sections and about 2000 tons of Light Rails. So far as known, there have been no cancellations of contracts for Rails by the railroads, nor are any expected. The Carnegie Company is filled up on Steam Rails to September, and on Light Rails for practically balance of the year. We quote Light Rails as follows: $33 to $34 for 20 to 45 lb.; $34 to $35 for 16-lb., and $35 to $36 for 12-lb., at mill. Angle Splice Bars are held at 1.65c., and Standard Section Rails at $28, at mill.

Structural Material.—The large Structural interests report inquiries much better. A good deal of tonnage has been placed and other large work is pending. The American Bridge Company has secured two contracts from the Baltimroe & Ohio, one for a Steel bridge across the Susquehanna River at Havre de Grace, involving 15,000 tons, and the other for the T street bridge in Washington, D. C., 1600 tons. Large new work coming up is the Jones & Laughlin Steel Company bridge across the Ohio River, from Ambridge, Pa., to its new plant at Aliquippa. The design of this structure has not been decided upon, but it is practically certain to be built and will require from 7000 to 10,000 tons of Steel. A county bridge is also to be built across the Allegheny River, from Oakmont, Pa., which will take about 1500 tons. Contract for this structure will be placed in a short time. It is believed there will be a steady increase in new tonnage being placed from this time forward, as there is so much new work in sight. The market is firm and we quote: Beams and Channels, up to 15-in., 1.70c.; over 15-in., 1.80c.; Angles, 3 x 2 x ¼ in. thick up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3-in. and larger, 1.70c.; Tees, 3-in. and larger, 1.75c. Under the Steel Bar card, Angles, Channels and Tees under 3-in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—A few of the smaller Plate mills are in position to make deliveries in from three to four weeks, but on such tonnage ask premiums of $1 to $2 a ton. The large Plate makers, notably the Carnegie Steel Company, are sold up from periods ranging from three months to six months, and are prorating orders. Some of the Plate mills are not able to get out anything like a full tonnage, on account of scarcity of Steel. We quote: Tank Plate, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c. to 1.80c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within 10 days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Sheets.—As set forth in this report last week, the American Sheet & Tin Plate Company cannot promise deliveries inside of 18 to 24 weeks, while other makers are unable to promise anything in less than 6 to 10 weeks. New demand continues urgent, and specifications on contracts are heavy. Sheet Bars, delivered to the mills this month, will be charged $30 to $31 on contracts, and the latter figure is asked on Bars for prompt shipment. Prices are firm, and we quote: Blue Annealed Sheets, No. 10 gauge and heavier, 1.85c.; Nos. 11 and 12, 1.90c.; Nos. 13 and 14, 1.95c.; Nos. 15 and 16, 2.05c.; Box Annealed, Nos. 17 to 21, 2.35c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.45c.; No. 27, 2.50c.; No. 28, 2.60c.; No. 29, 2.75c.; No. 30, 2.85c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.65c.; Nos. 12 and 14, 2.75c.; Nos. 15 and 16, 2.85c.; Nos. 17 to 21, 3c.; Nos. 22 and 24, 3.15c.; Nos. 25 and 26, 3.35c.; No. 27, 3.55c.; No. 28, 3.75c.; No. 29, 4c., and No. 30, 4.25c. We quote No. 28 Gauge Painted Roofing Sheets at $1.85 per square, and Galvanized Roofing Sheets, No. 28 gauge, $3.25 per square for 2-in. corrugations. These prices are for carload lots, jobbers charging the usual advances.

Hoops and Bands.—Specifications on contracts are heavy, but very little new tonnage is being placed, consumers having covered their wants some months ago. Prices are firm, and we quote: Steel Hoops, 2c., and Bands for all purposes at 1.60c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of $2 a ton being charged for less than carloads.

Tin Plate.—A heavy tonnage of Tin Plate has been entered by all mills for delivery through third quarter, and most of the leading makers have their product engaged so far ahead that they cannot promise deliveries inside of three to four months. Official prices for second and third quarter shipment are as follows: $3.90 for 100-lb. Cokes, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in 10 days, on which price a rebate of 5c. a box is allowed for carload and larger lots.

Iron and Steel Bars.—Some good sized contracts from agricultural implement makers for Steel Bars for forward delivery have been placed at the full price of 1.60c., Pittsburgh. Leading Steel Bar mills are sold up for three or four months, and in some cases for a longer period. Mills that can make reasonably prompt deliveries have no trouble in getting $2 a ton or more advance over the 1.60c. price. New business in Iron Bars continues heavy, and specifications on contracts are coming forward freely. We quote Refined Iron Bars at 1.80c., Pittsburgh, and Steel Bars at 1.60c., base, half extras, f.o.b. Pittsburgh, these prices being for forward delivery.

Spelter.—The market is quiet and prices are decidedly easier. We quote prime grades of Western Spelter for spot shipment at 6.70c., St. Louis, while for May and June we quote 6.65c., St. Louis, or 6.67½c., Pittsburgh.

Railroad Spikes.—We note a continued heavy demand for the smaller sizes, while for the Standard sizes the demand is not quite so active. The mills are from two to three months behind in deliveries on the smaller sizes, but can make quicker shipments on standard sizes, on which we quote $2.30 to $2.35, and the smaller sizes at $2.50 to $2.60 per 100 lb., f.o.b. Pittsburgh.

Merchant Steel.—Only a fair amount of new tonnage

is being placed, but specifications on contracts are coming in freely and shipments are heavy. Prices are unchanged but firm, and we quote: Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c., for ordinary grades, and 10c. and upward for special grades. We quote Cold Rolled Shafting at 50 per cent. off in carloads, and 45 per cent. in less than carloads, delivered in base territory.

Merchant Pipe.—There is no cessation in the demand, which continues enormously heavy, and the mills are getting steadily further behind in deliveries. Some large contracts for Line Pipe are being figured on, but none of the mills is in position to take on more tonnage in the large sizes for delivery inside of three to four months. The extreme discount on Merchant sizes of Iron Pipe is now about 68 per cent. on ¾ to 6 in., on which a half point and sometimes a point is allowed to the large trade. The extreme discount on Merchant sizes of Steel Pipe, ¾ to 6 in., is now about 74 and 5 per cent. to the large trade. Official discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel.	
	Black.	Galv.
	%	%
⅛ to ¼ in	65	49
⅜ in	67	53
½ in	69	57
¾ to 6 in	73	63
7 to 12 in	68	53
Extra strong, plain ends:		
⅛ to ⅜ in	58	46
½ to 4 in	65	53
4½ to 8 in	61	49
Double extra strong, plain ends:		
½ to 8 in	54	43

Official discounts on Iron Pipe, which are shaded one-half point or more to the large trade, are as follows, f.o.b. Pittsburgh:

Standard Genuine Iron Pipe.

	Black.	Galv.
	%	%
¾ to 6 in	68	58
½ in	63	51
⅜ in	61	43
⅛ and ¼ in	59	43
7 to 12 in	63	48
Extra Heavy Iron Pipe, Plain Ends.		
⅛, ¼ and ⅜ in	63	41
½ to 4 in	60	48
4½ to 8 in	56	43

Boiler Tubes.—The demand for both Locomotive and Merchant Tubes continues active, and prices are strong, consumers being willing to pay $2 to $3 a ton premium to get reasonably prompt deliveries. Official discounts, which apply only on Tubes for forward delivery, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in	41	47
1¾ to 2¼ in	42	59
2½ in	47	61
2¾ to 5 in	52	65
6 to 13 in	42	59

Iron and Steel Scrap.—The Scrap market continues quiet, as far as sales go, consumers being pretty well covered, and the tendency of prices is toward lower values. Dealers quote as follows: Heavy Steel Scrap, $18 to $18.25, for Pittsburgh, Sharon or Steubenville delivery; No. 1 Wrought Iron Scrap, $19.50; No. 2, $18; Old Steel Rails, short pieces for Open Hearth purposes, $18 to $18.25; Old Steel Rails, rerollers, $19.75 to $20; Machine Shop Turnings; $15.75 to $16; Bundled Sheet Scrap, $16.75 to $17; Tin and Terne Plate Clippings, $18.50 to $19, in net tons. Low Phosphorus Melting Steel is $22; Cast Iron Borings, $14.50; Old Car Wheels, $24.50 to $25; Steel Axles, $22 to $22.50; No. 1 Cast Scrap, $21.50; Grate Bars, $17; Stove Plate, $16.50. All above prices are per gross ton, f.o.b. Pittsburgh, unless otherwise noted.

Coke.—We are advised of a sale of 1500 tons of Connellsville Furnace Coke, for prompt delivery, on the basis of $2.80 a ton at oven. Prices on both Furnace and Foundry Coke are easier, due to an ample supply of Coke and cars for shipment. We quote Connellsville Furnace Coke for prompt shipment at $2.75 to $2.80 a ton at oven, and 72-hour Foundry at $3.25 to $3.50 a ton at oven.

The offices of the Green Engineering Company, manufacturer of Green Traveling Link Grates, have been removed from the Lewis Building to 1222 Farmers' Bank Building, Pittsburgh.

The offices of Geo. A. McLean & Co., dealers in Iron and Steel Scrap, have been removed from the Lewis Building, where they have been located for over 20 years, to their Scrap yards, corner of Beaver avenue and Rebecca street, Allegheny, Pa.

About May 1 the Dodge Mfg. Company, manufacturer of Power Transmission Machinery, will remove from 337-339 Water street, to 337 Second avenue, Pittsburgh.

The L. B. Foster Company, Railroad Supplies, Iron and Steel, has removed its offices to larger quarters in Rooms 629-630 Park Building, Pittsburgh. The Ohio Rail Company, with mills at Newark, Ohio, of which L. B. Foster is president, also has its offices in the same rooms.

The offices of S. V. Huber & Co., consulting engineers, have been removed from Ferguson Building to Rooms 528-529 Fulton Building, Pittsburgh.

C. H. Daker, formerly of Detroit, Mich., is now connected with the Pittsburgh office of Hickman, Williams & Co., dealers in Pig Iron, German National Bank Building, of which T. Coleman Ward is resident manager.

Cleveland.

CLEVELAND, OHIO, April 9, 1907.

Iron Ore.—The taking of Ore from the mines to the docks was started at Ashland and Escanaba last week and a local shipper began to bring Mesaba Ore into Duluth on Monday of this week. The present condition of the ice at the Soo and at Lake Superior ports leads vesselmen to doubt whether Ore cargoes can get away before April 20, although some of the shippers are planning to have their boats start about April 14, so as to reach Lake Erie ports with their first cargoes about April 20. At present the ice is solid at all the Ore shipping docks, so that the boats cannot reach the docks to be loaded. The general start of the Ore boats that wintered at Lake Erie ports will not be made before the middle of the month and the steamers of the Pittsburgh Steamship Company will not be sent out before April 15 or 20, so that they will not make more than one trip during April. Ore shipments from the docks have been very heavy the past week. There have been plenty of cars, and as much Ore as possible was rushed to the furnaces to escape the advance of 5c. a ton in Ore rates, which went into effect April 6. The better grades of Ores are now pretty well cleaned up from the docks. Ore prices are very firm. There have been some inquiries for high grade Ore the past week but the supply is limited. Some of the better grade of Mesaba Bessemer has been sold recently at $5 per ton, an advance of 25c. over the established price. There is plenty of Siliceous Ore still unsold, many consumers not yet having covered. Ore prices for 1907 deliveries at Lake Erie docks are as follows per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.25; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.50.

Pig Iron.—The market has been very quiet. The lively demand for spot Foundry Iron, which existed for two or three weeks, has subsided, indicating that the foundrymen, who had failed to cover sufficiently, are now pretty well supplied. Foundries in this district seem to be well covered now for the second quarter, and as there is but little spot or second quarter Foundry Iron left to be sold not much activity is expected in the market during the next few weeks. Prices remain firm, and no change is expected soon. Their output is so well sold up, both for the second quarter and the second half, that the furnaces are not disposed to sell Iron at lower prices than those that have been prevailing the past few weeks. The Foundry Iron market for the second half remains the same as it has for the past month, there being but few inquiries and sales. The sales of No. 2 Northern Foundry that have been made the past week have been at from $24.50 to $25, for prompt shipment. Sales of No. 2 for second half delivery have been made at $22 and $22.50, Valley furnace. For the latter part of the second quarter the furnaces are asking $24. The Basic Iron market is strong, and the furnaces are holding firmly at $21, Valley furnace, for last half delivery. There are no inquiries as yet for Basic Iron for the last half. Spot Basic is in good demand, but the available supply is small. The furnaces are holding spot Basic at $22.50 to $23. Some Bessemer Iron has been sold in the local market the past week at $23, Valley furnace, for spot shipment. Quotations for the last half of 1907, f.o.b. Cleveland, are as follows:

Bessemer	$21.50 to $22.00
Northern Foundry, No. 1	22.50 to 23.00
Northern Foundry, No. 2	22.00 to 22.50
Northern Foundry, No. 3	21.50 to 22.00
Southern Foundry, No. 2	22.85
Gray Forge	21.00 to 21.50

Coke.—The market is quiet, and there are scarcely any inquiries either for prompt shipment or for future delivery. Prices remain unchanged. Dealers are asking $2.90 for Furnace Coke at oven, and Foundry Coke is held at $3.50 to $3.75 at oven. Consumers seem to be pretty well covered till June and July.

Finished Iron and Steel.—Specifications continue to come in very heavily, particularly on Shapes and Plates, and consumers are pressing mills for deliveries on material specified for some time ago. New business is also good, the demand for Sheets, Bars and Structural Material for second half deliveries still being heavy. Deliveries on the whole show no improvement, those from mills in the Pittsburgh District being reported to be a little worse, if anything. One sale of 12,500 tons of Steel Bars for last half delivery was made in the local market the past week at the prevailing

price of 1.60c., Pittsburgh. The large consumers are reported now to be pretty well covered on contracts for Bars and Structural Shapes for second half delivery. The general situation continues highly satisfactory as far as the local market is concerned, with the exception of deliveries. A limited amount of new business for early shipment is being contracted for at premium prices. A leading interest in making future contracts is not promising any deliveries before about October 1. One of the western Pennsylvania mills, that has not been making deliveries on Plates within from 60 to 90 days, has been partly able to catch up and is now promising shipment on Universal Plates in 30 days. Steel Bars are still very scarce for quick delivery, and the most of the mills are about five months behind. Some sales of Steel Bars are reported in the local market at 1.90c., Pittsburgh, for delivery in from three to four weeks. Iron Bars are still being sold at 1.75c., Pittsburgh, for good orders. Some small sales of Plates are reported at 2c., Pittsburgh, for quick shipment. One mill that has been holding Plates at 2c., Pittsburgh, is now offering Tank Plates at 1.90c., for early shipment of good sized orders. Billets are in fair demand, but not many are being sold at premium prices. Mills quote Rerolling Billets at $31 to $32.50, Cleveland, and Forging Billets at $36 to $40, Cleveland. Local jobbers continue to do a heavy warehouse business and are having trouble in keeping their stocks replenished, the standard sizes being sold out about as fast as they are received from the mills. The Sheet situation remains unchanged, deliveries not being promised within about six months. Warehouses are selling Steel Bars at 1.95c. to 2c. out of stock, and Iron Bars at 2c., the price being unchanged. Jobbers' prices on Sheets are as follows: Blue Annealed, No. 10, 2.30c.; No. 28, One Pass Cold Rolled, 3.05; No. 28, Galvanized, 4.15c. The stock price on Boiler Tubes, 2¼ to 5 in., is 64 per cent. discount.

Old Material.—The market is dull, and prices are steady. The demand for Cast Scrap, Borings and Turnings continues good, with the supply scarce. Otherwise little activity is noted. Consumers seem unwilling to pay the present prices, and dealers show no weakening. Inquiries for future deliveries are quite scarce. The railroads made no offerings during the past week. Indications are not very bright for a much more active market in the near future. Dealers' prices are unchanged from a week ago. They are as follows, per gross ton, f.o.b. Cleveland:

Old Steel Rails	$17.50 to $18.00
Old Iron Rails	23.50 to 24.50
Steel Car Axles	21.50 to 22.50
Relaying Rails, 50 lb. and over	29.00 to 31.00
Relaying Rails, under 50 lb.	31.00 to 32.50
Heavy Melting Steel	16.50 to 17.00
Railroad Malleable	17.50 to 18.50
Agricultural Malleable	15.50
Light Bundled Sheet Scrap	16.00 to 17.00
Bundled Tin Scrap	17.00 to 19.00

The following quotations are per net ton, f.o.b. Cleveland:

Old Car Axles	$29.25 to $29.75
Cast Borings	10.50 to 11.00
Iron and Steel Turnings and Drillings	13.00 to 13.50
No. 1 Busheling	14.50 to 15.00
No. 1 Railroad Wrought	17.50 to 18.00
No. 1 Cast	18.00 to 18.50
Stove Plate	14.50 to 15.00

Philadelphia.

PHILADELPHIA, PA., April 9, 1907.

There is no distinct weakness in either Pig Iron or finished products, but irregularity is developing, and mostly in the direction of slightly lower prices. Quotations are not materially different from what they have been for some weeks, but some grades of Pig Iron are in better supply, and can, therefore, be had at 25 to 50 cents reduction from last week's prices. Foundry Irons, if not strong, are certainly not lower, although there appears to be less difficulty in securing moderate quantities for delivery during the next couple of months. Prices for this grade, third quarter delivery, are also pretty firm, as the gap between the second and third quarter is gradually closing up. Fourth quarter Foundry Iron, however, is inclined to be weak, and it would not be difficult to place orders at $1 to $1.50 less than is quoted for second quarter Iron. The furnaces are being hard pushed every day by those who have material due them, and although there seems to be a slight abatement from the extreme scarcity which has so long prevailed, yet it must be said that material is not plentiful by any means. Quotations for Foundry grades vary considerably, as it depends a good deal on what the requirements of the buyer are and what tonnage he will take for the third quarter, in addition to what is required for an earlier date. Producers are anxious to maintain pleasant relations with their regular trade, and therefore make the conditions as easy as possible, rather than exact the last cent that can be gotten out of them. It is open to question, however, whether the somewhat easier conditions to which we have referred are due to a slight decrease in consumption, or a better output by the furnaces, and it will take some time to determine which will be the controlling factor. Without being in any way pessimistic, there can be little doubt that the situation is more sensitive to-day than it has been for several months, and it would be taking great risks to assert that the next movement will be toward easier rates, or the reverse, but if the present figures can be maintained during the spring and summer months makers of Pig Iron will be well satisfied. Every movement is watched with the greatest interest, but even those who have had the longest experience in the trade hesitate to express positive opinions either way. The movement of Pig Iron from abroad is again somewhat larger. Two or three additional cargoes of Middlesbrough Iron have been engaged during the past few days, and also a 5000-ton cargo of Scotch Iron, all for this port. There can be no doubt that Middlesbrough Iron has prevented a runaway market, and if shipments are continued, as will no doubt be the case if prices here remain at about to-day's figures, it will be a pretty effectual barrier to any appreciable advance on to-day's quotations.

Pig Iron.—It appears to be more difficult than ever to give a concise and satisfactory report of prices or conditions in the Iron market. There is such a variety of opinions and such a variety of prices that it is almost impossible to state what the exact conditions are. Sales are made at so many different quotations that they may mean almost anything. From some points of view it might be inferred that the market is as strong as ever, yet there are other indications that would lead to an entirely different opinion. Foundry Iron is the most actively traded in, and quotations range from $26 for Spot Iron down to $24.50 for deliveries covering the entire second quarter and about $23.75 to $24 for the third quarter. Most of the transactions, however, are for small lots and for prompt shipment, there being but little disposition to buy heavily for forward delivery. As a rule, sellers of Pig Iron appear to be quite sanguine in regard to the future, and are making no great efforts to secure business, as they say they have large orders on their books and can well afford to wait further developments. Gray Forge Iron has developed a good deal of irregularity, and it is almost impossible to harmonize the various reports which are given in regard to this class of Iron. Sales have been made at $22, delivered, at mills in the Harrisburg District, and it is also said to have been offered at $22.50, Philadelphia, while others claim that they have no difficulty in getting $22.75 to $23, and, in fact, it is claimed that orders for thousands of tons could be filled within the limits named if the material was available. Middlesbrough Iron can be had at somewhat lower figures, say, $21 to $21.50, alongside ship for No. 3 Foundry, and it is said that additional purchases have been made for shipments to this and other Atlantic ports, and which will be available in the course of the next 30 days. Two or three steamers are due to arrive during this month, so that the supply of this class of Iron is likely to continue for some time, at about the figures named. There is nothing doing in Basic Iron, consumers having apparently all that they need for the second quarter unless furnace deliveries again disappoint them. For the second half of the year there is no disposition to buy, and leading consumers state that until they can get some new business they will abstain from the purchase of raw material. Low Phosphorus Iron has been sold at about $27, delivered, for one 500-ton lot, and $27.25 to $27.50 for smaller quantities, but there is no great demand at the present time. Quotations vary according to the dates for deliveries; but, as a rule, they range within the following limits for deliveries in consumers' yards, eastern Pennsylvania or adjoining districts:

Second Quarter 1907.	
No. 2 X Foundry	$24.50 to $25.00
Standard Gray Forge	22.50 to 23.00
Basic	24.00 to 24.50
Low Phosphorus	27.00 to 27.50
Middlesbrough, on dock	21.25 to 21.75
Third Quarter 1907.	
No. 2 X Foundry	$24.00 to $24.25
Standard Gray Forge	22.00 to 22.50
Basic	24.00 to 24.25
Low Phosphorus	27.00 to 27.25
Fourth Quarter 1907.	
No. 2 X Foundry	$23.25 to $23.75
Standard Gray Forge	21.50 to 22.00
Basic	23.50 to 23.75
Low Phosphorus	26.75 to 27.00

Ferroalloys.—There is some business doing, but at figures which are a little uncertain. Spot lots would command $69 to $70, or for shipment during this or next month about $68, or possibly a little less. The demand is chiefly for the last half, however, for which prices continue weak and irregular; probably $63 to $65 would cover the range for that delivery.

Steel.—Business is fairly active, although large orders are not numerous. Lots of 1000 to 2000 tons, however, are pretty well taken, at about $31.50 to $32, delivered, and about $32.50 for smaller quantities of Open Hearth Billets. Forging Steel remains firm, at about $36 to $40, according to the requirements.

Plates.—The demand is fairly active, but not specially urgent, although some very desirable orders have been placed within the last few days. Prices, however, are somewhat irregular, with quotations ranging from 2.03½c. to 2.08½c. for ordinary Tank or Boat Steel. Specifications are coming in

satisfactorily and mills are still running about up to their full capacity. Prices are as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	2.03½	2.08½
Flange or Boiler Steel	2.23½	2.28½
Marine	2.53½	2.58½
Locomotive Firebox Steel	2.63½	2.68½

The above are base prices for ¼-in. and heavier. The following extras apply:	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—There is less activity than there was during the first two months of the year, and although the mills are well employed they have not much work on the books for forward delivery. Buyers realize that the capacity for production is ample for all requirements and are therefore disposed to place orders as may be required from time to time. Prices are not very strong, although quotations are nominally 1.83½c. to 2c. for Beams, Angles and Channels, with slight concessions on first-class business.

Bars.—The demand for Refined Bar Iron is pretty good, although it is sometimes done at trifling concessions from the nominal rate, which is supposed to be 1.93½c., but it must be something very attractive to secure more than a half tenth reduction. Steel Bars are still scarce, and for shipments this side of midsummer prices are about the same as those for Refined Iron.

Sheets.—There is a good demand for Sheets, and the mills are pushed for deliveries as much as they have been at any time for several months past. Prices, therefore, are quite firm, and for mill shipments may be quoted as follows, subject to the usual advance for small lots: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 to 26, 3c.; No. 27, 3.10c., and No. 28, 3.20c.

Old Material.—The market begins to show signs of weakness and almost all descriptions can be had at something less than was paid during the latter portion of last month. Steel Scrap is relatively firm on account of the high price of Basic Pig Iron, but Rolling Mill Stock and Foundry Scrap are easier and can be bought at less money than was quoted a week ago. Bids and offers at this date for delivery in buyers' yards in this district are about as follows:

Steel Crops and Rails	$18.75 to $19.00
No. 1 Steel Scrap	18.50 to 18.75
Low Phosphorus	22.50 to 23.50
Old Steel Axles	21.50 to 22.00
Old Iron Axles	30.00 to 31.00
Old Iron Rails	27.00 to 27.50
Old Car Wheels	24.00 to 25.00
Choice No. 1 R. R. Wrought	20.50 to 21.00
No. 1 Yard Scrap	18.50 to 19.00
Long and Short	18.00 to 18.50
Machinery Scrap	21.00 to 21.50
Wrought Iron Pipe	16.75 to 17.00
No. 1 Forge Fire Scrap	16.50 to 17.00
No. 2 Light	11.50 to 12.00
Wrought Turnings	16.25 to 16.75
Axle Turnings	16.75 to 17.00
Stove Plate	17.00 to 17.50
Cast Borings	15.50 to 16.00
Grate Bars	15.75 to 16.00

Ernest Law & Co., Coal and Coke, Harrison Building, Philadelphia, announce that they have secured the services of L. Minford Humrichouse as manager of their Coal department.

Potts & Wittman, 308-309 North American Building, Philadelphia, have been appointed sole representatives in America of Hirsch & Co., Limited, London, England, and Frankfort a. M., Germany, for the sale of Pig Iron, Ferromanganese, Ferrosilicon, Ferrochrome, Ferrophosphorus, Spiegeleisen and Iron Ores.

Cincinnati.

FIFTH AND MAIN STS., April 10, 1907.—(*By Telegraph.*)

Pig Iron.—The market is rather quiet and inquiry in a general way is said to be light. Owing largely to the liberal movement of Iron from the South during the past two or three weeks, the spot feature of the situation that has shown with so much prominence during the past six months is gradually disappearing, and premium prices for this delivery are now the exception instead of the rule. Prices for the second quarter and spot for April delivery are therefore more on a parity, as shown by the table below, representing, as it does, established quotations for the second quarter. Reports indicate that there is very light tonnage to be had from either Northern or Southern furnaces for second quarter delivery, with a large percentage of anticipated production sold for third quarter. It is believed, however, that considerable Iron remains unsold for fourth quarter, with $18.50 the ruling quotation for any delivery after July 1. The indications are that Southern furnaces had a much smaller tonnage on their yards than was anticipated, a large proportion of which has since been shipped. From the difficulty that is now being experienced in securing a supply of raw material, it is problematical when a change may be expected and stocks on yards show any material increase. No inquiries of any magnitude are reported for the week, excepting those mentioned in last week's issue, neither of which have as yet been consummated. As noted above, the schedule as shown below will be for second quarter delivery, and not for spot shipment, as has been the custom heretofore. Urgent cases are reported where $22.50 to $23, Birmingham, has been obtained for Iron on tracks or in transit, with $22 apparently representing the maximum figure for delivery during May and June. Freight rates from Hanging Rock District to Cincinnati are $1.15, and from Birmingham, $3.25. We quote for second quarter delivery, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$25.25 to $25.75
Southern Coke, No. 2	24.75 to 25.25
Southern Coke, No. 3	24.25 to 24.75
Southern Coke, No. 4	23.25 to 23.75
Southern Coke, No. 1 Soft	25.25 to 25.75
Southern Coke, No. 2 Soft	24.75 to 25.25
Southern Coke, Gray Forge	22.25 to 22.75
Southern Coke, Mottled	21.25 to 21.75
Ohio Silvery, 8 per cent. Silicon	31.15 to 31.65
Lake Superior Coke, No. 1	25.15 to 25.65
Lake Superior Coke, No. 2	24.65 to 25.15
Lake Superior Coke, No. 3	24.15 to 24.65
Car Wheel Irons.	
Standard Southern Car Wheel	$29.00 to $29.50
Lake Superior Car Wheel	27.50 to 28.00

Coke.—The market is weak, and prices are a shade lower. A fair supply is obtainable to meet all requirements. Contract business is light, and general conditions are quiet. We quote the best brands of Connellsville and Virginia Foundry from $3.50 to $3.65, f.o.b. ovens.

Finished Iron and Steel.—There has been no material change in conditions since last week. The demand for Plates continues quite strong, and anything like prompt shipment from the larger mills is difficult to secure. The independent mills that have been taking orders for quick shipment are said to be somewhat congested, and are quoting longer deliveries than a week since. One of this latter class is said to be quoting four to five weeks at a stiff premium. Structural mills are still quoting reasonably prompt shipments, and orders during the week have been quite heavy. We quote, f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.83c., with half extras, smaller lots from store 2c., with full extras. Steel Bars, carload lots, 1.73c., half extras, smaller lots from store 1.95c., with full extras. Base Angles, carload lots, 1.83c. Beams and Channels, carload lots, 1.83c., base. Plates, ¼-in. and heavier, carload lots, 1.83c., base., and smaller lots from store 2c. Sheets, No. 16, carload lots, 2.05c., and smaller lots from store 2.60c.; No. 14, carload lots, 1.95c., and smaller lots from stock 2.50c. Steel Tire, 1 x ¼ in. or heavier, 1.93c. in carload lots.

Old Material.—Locally, the market has been rather quiet, and nothing out of the ordinary has transpired. Prices are about the same as last week. We quote dealers' prices, f.o.b. Cincinnati, as follows:

No. 1 R. R. Wrought, net ton	$18.50 to $19.00
Cast Borings, net ton	10.00 to 10.50
Steel Turnings, net ton	12.00 to 13.00
No. 1 Cast Scrap, net ton	18.00 to 18.50
Old Iron Axles, net ton	26.75 to 27.75
Old Iron Rails, gross ton	27.00 to 27.50
Old Steel Rails, long, gross ton	19.25 to 20.25
Relaying Rails, 56 lb. and up, gross ton	28.75 to 29.75
Old Car Wheels, gross ton	24.00 to 25.00
Low Phosphorus Scrap, gross ton	21.25 to 21.75

The German Iron Market.

BERLIN, March 28, 1907.

The recent sharp reaction on all the leading stock exchanges in the world, together with the prevalence of money stringency everywhere, has subjected the German Iron situation anew to a searching inquiry as to the probabilities of the continuance of boom conditions. The uncertainty as to the reorganization of the Steel Association and several other combinations has caused dealers to adopt a decidedly waiting attitude, and this attitude has only been intensified through the continued dearness and scarcity of money. Dealers are therefore slow in placing orders for the replenishment of their stocks. Another thing that might be regarded as indicating a change in the situation is the reduced importations of Pig Iron in February, the movement having amounted to only 14,200 tons, as against 21,700 tons in January. The import of Iron Ores, too, fell from 306,900 tons in January to 238,800 tons in February.

Otherwise there is nothing going to show that the boom has passed its zenith, but much to indicate that business in the industry will continue to hum as usual throughout the rest of the year. The reduction in Ore imports turns out to have been only temporary, caused largely by the un-

favorable weather of February. During the first 10 days of March imports reached 440,000 tons. Domestic Ore producers have sold their output, in nearly all cases, till the end of the year, and prices have remained very firm. The mines of the Siegen District sold the rest of their available supplis of Feldspathic Ores at 19.50 marks, while Swedish Ores containing phosphorus are coming into the Westphalian region at 22 marks per ton, with higher prices for Ores free of phosphorus. Larger arrivals of foreign Ores rich in manganese are reported, but there is a slower pace in placing new orders.

Continued Scarcity of Pig Iron.

In Pig Iron there has been no let-up in production and the scarcity of material continues unabated. The February make amounted to 978,191 metric tons, as compared with 938,434 tons in February, 1906. The February figures were about 84,000 tons less than those for January, the reduction being fully accounted for by the shortness of the month and the extraordinarily unfavorable weather, which hindered the movement of Coke and other supplies. The last named factor continus to interfere with production, owing to the inability of the railroad authorities to supply sufficient Coal cars in the Rhenish-Westphalian District. It is feared that some blast furnaces will have to bank their fires unless the deliveries of Coke can be increased.

The scarcity of Steel material has not been relieved and consumers are trying, without much success, to place orders for supplementary amounts for the second quarter of the year. Some consumers, too, are trying to get old arrearages made up. Home contracts are being interfered with by the uncertainty as to whether the Steel Association will be prolonged beyond April 30. That question will be referred to below. The shipments of the association in half-rolled material, Rails and Structural forms in February reached 449,200 tons, or 11,700 tons more than in the corresponding month of 1906, but 40,600 tons less than for January. Shipments were hindered to a considerable extent by the weather, the Rhine being closed to navigation a part of the month through ice, and the annual carnival on the lower Rhine partly withdrew the labor supply. The mills themselves are consuming so much of their own product that the shipments of half-rolled material amounted to only 141,300 tons, or about 15,000 tons less than in February, 1906. There was a gain, however, of 27,400 tons in shipments of Steel Rails and other railroad supplies.

Rails and other railroad supplies continue in heavy demand. Foreign orders continue to arrive, but these are taken only in part, owing to the heavy pressure of home business. Engagements will last far into the autumn. This is also true of Rails for mines, as well as Grooved Rails for street railroads. Heavy Rails for export command $27.40 to $28, f.o.m. seapoht, according to country of shipment. There is an unusually large demand for rolling stock supplies, especially Axles and Wheels. The foreign market is demanding the latter goods in large quantities. Business in Steel Castings generally is reported to be still in a very satisfactory position.

At a recent meeting of the Society of German Machinery Builders at Düsseldorf it was stated that the 44 machinery concerns organized as joint stock companies, having an aggregate capital of $11,140,000, showed a total loss of $1,485,000 for their last business year, which ended in most cases with June 30, 1906. The causes to which this poor result were attributed were the difficulty of getting raw materials and the high prices of these, labor troubles, and the revolution going on in types of machines called for, largely incident upon the progress of electricity.

The Renewal of the Verband.

The question of the renewal of the great Steel Association reached last week a critical stage, and the negotiations were officially declared broken off. This was understood on the Stock Exchange as ending the existence of the combination and Iron shares accordingly had a severe fall. At this moment it is still uncertain whether it will be renewed. The point of most serious difficulty is with the Westfälische Stahlwerke, a concern which has hitherto been an outsider, but whose joining is now regarded as essential to the success of the combination. This company is now spending above $1,500,000 in renovating and improving its plant at Bochum and it demands allotments of 235,000 tons of Steel as condition for joining the association, although its yearly output hitherto has been only about 120,000 tons.

Upon this demand the views of the association and the directors of the company proved to be irreconcilable, and the association called off the negotiations and roundly declared that it would go out of existence rather than grant the demand, and that it would not prolong its life without the accession of the Westfälische Stahlwerke. The newspapers have this week printed the final letter of the association to that company, and it is of a very vigorous and direct character. It tells the latter that the other Steel works are exceedingly embittered over its excessive demands, but that they would prefer to go without a common organization rather than artificially to foster an establishment which would not be able to hold its own under free competition. It offers the company an allotment of 130,000, and informs it that no further negotiations for the renewal of the association will be made until the demand is materially reduced. The company holds a meeting to-morrow to consider the association's letter, and it will perhaps have to "crawl down."

The Siegen Pig Iron Syndicate, after having given notice of its dissolution on June 30, seems after all to be on the point of reaching an agreement for its prolongation. The Geisweider Eisenwerke, which had drawn out some six months ago because it had enlarged its capacity for producing Spiegeleisen and could not get its allotments increased to the extent desired, seems now to be in a more compromising spirit. The newspapers to-day report that a plan has been adopted, in agreement with Geisweider, to continue the combination.

New York.

NEW YORK, April 10, 1907.

Pig Iron.—There have been no important transactions in this market during the past week, some of the business pending last week not having been closed. It is not indicated that close figures have been put in. Prices are irregular, in spite of the fact that inquiries have grown more numerous and important, in one case for the balance of the year. We quote spot Northern Iron $25.50 to $26, and $24.25 to $24.75 for No. 2 Foundry. For the second quarter we quote $25 to $25.50 for No. 1 Foundry, $23.50 to $24 for No. 2 Foundry and $23 to $23.50 for No. 2 Plain. Southern Iron is nominally quoted for spot $26 to $26.50 for No. 2 Foundry, and for the third quarter the price is $22.75 to $23.

Steel Rails.—Some little tonnage is pending, including additional requirements for two Western roads, one of these latter inquiries being for 10,000 tons. The foreign business recently talked of is being bid on by a number of mills. Of the 5000 tons additional for which the Chesapeake & Ohio has been in the market recently, 1000 tons was placed. Another order of the week was for 1000 tons for the Tennessee Railway.

Structural Material.—Recent specifications to the Structural mills have been of fair proportions—sufficient to guarantee steady operation—but Shapes are not up to other lines in the amount of business ahead. Additions to capacity in the past 15 months have done more to produce this condition, apparently, than the fact that Structural Steel has fallen greatly out of step with other products. In the past week the Susquehanna River bridge of the Baltimore & Ohio at Havre de Grace, Md., has been awarded to the American Bridge Company. It will require 15,000 tons of Steel. The Baltimore & Ohio also gave a contract to the same company for 1600 tons of viaduct work. Other business entered on the books of the American Bridge Company includes 1900 tons of grade crossing work at Chicago for the Chicago & Northwestern, 2000 tons for the German-American Insurance Company Building on William street, New York; 2400 tons for the new First National Bank Building, San Francisco, on the site of the proposed Masonic Temple, and 700 tons for the Bank of Berkeley, at Berkeley, Cal. The Mechanics' Savings Bank, at San Francisco, and an office building, together amounting to 900 tons, were taken by Milliken Bros., Incorporated, New York, who also were awarded contracts for two buildings at Seattle, Wash. Thus far it is estimated that considerably more than 30,000 tons of Structural Steel has been let for the rebuilding of San Francisco, but only a good beginning has been made. In New York City a large building is being figured on, to be located at Fifth avenue and Fourteenth street. We quote, tidewater deliveries, on mill shipments, as follows: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.99½c. On Beams 18 to 24 in. and Angles over 6 in. the extra is 0.10c. Sales are made out of stock of material cut to length at 2¼c. to 2½c.

Bars.—An improved condition is noted, with not only more inquiries, but with sales of several thousand tons of Bar Iron for delivery over the next 60 to 90 days, and some good sales of Steel Bars. Prices are continued on the basis of 1.84½c. to 1.89½c., tidewater, for either Best Refined Iron or Steel Bars, although on desirable orders the Bar Iron prices may be shaded slightly.

Plates.—Local trade shows no improvement. Current business is confined to small lots. The mills are still well supplied with work, and local sales agents report no anxiety on the part of their principals to secure more business. The range of quotations, at tidewater, continues as follows, the inside figures being named by Western mills for delivery far in the future: Sheared Tank Plates, 1.84½c. to 2.04½c.; Flange Plates, 1.94½c. to 2.14½c.; Marine Plates, 2.24½c. to 2.34½c.; Firebox Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—Some small orders are being placed, but inquiries are light. Prospects are good, as a great deal of work is contemplated for which the Pipe has not yet been bought. Nevertheless, some apprehension is felt as to whether the present lull means that buyers have been adversely influenced by recent happenings in the stock mar-

ket, or whether they are simply waiting until the season is a little more advanced and weather conditions are more propitious for outdoor work. Prices are firm, carload lots of 6-in. still being quoted at $35.50 to $36 per net ton, at tidewater.

Old Material.—Heavy Melting Steel Scrap, Heavy Cast Scrap, Cast Borings, Heavy Turnings, Wrought Pipe, and Grate Bars have been in quite good demand. A number of important consumers are urging more rapid deliveries on Steel Scrap, as the stocks at their works are running low, and in some cases are insisting that cars be traced. Reports are current that rather large quantities of Old Material have been sold to various consumers throughout the East, prices having been made attractive to the buyers, but authentic information is lacking except with regard to a few transactions. Sales are known of 1500 tons of Heavy Melting Steel Scrap, 500 tons of Heavy Cast Scrap, 500 tons of Stove Plate and 500 tons of Busheling Scrap, all for delivery through the next 60 days, but with shipments to begin as quickly as possible. No. 1 Railroad and No. 1 Yard Wrought are easy, although some tonnage is moving. Busheling Scrap, however, is not only in good demand, but scarce. Quotations per gross ton, f.o.b. New York, are as follows:

Old Girder and T-Rails for Melting	$16.00 to $16.50
Heavy Melting Steel Scrap	16.00 to 16.50
Old Steel Rails, rerolling lengths	18.00 to 19.00
Relaying Rails	27.00 to 28.00
Old Iron Rails	23.50 to 24.00
Standard Hammered Iron Car Axles	28.50 to 29.00
Old Steel Car Axles	20.50 to 21.00
No. 1 Railroad Wrought	19.00 to 19.50
Iron Track Scrap	17.50 to 18.00
No. 1 Yard Wrought, long	17.50 to 18.00
No. 1 Yard Wrought, short	17.00 to 17.50
Wrought Pipe	14.50 to 15.00
Light Iron	11.00 to 11.50
Cast Borings	12.50 to 13.00
Wrought Turnings	14.50 to 15.00
Old Car Wheels	22.00 to 22.50
No. 1 Heavy Cast, broken up	19.00 to 20.00
Stove Plate	16.00 to 16.50
Grate Bars	14.00 to 14.50
Malleable Cast	19.50 to 20.00

The Scranton Bolt & Nut Company has removed its New York offices from the Trinity Building to the new West Street Building, West and Cedar streets, New York, where suite 1210 will be occupied. E. M. Zehnder is president; C. H. Zehnder, vice-president; F. B. Rutter, general sales agent, and C. E. Brodhead, Jr., sales agent for New York and New Jersey. A portion of the suite is used as offices of the Allegheny Ore & Iron Company, Austin Coal & Coke Company, Alma Cement Company and Wilmington Iron Company, of all of which C. H. Zehnder is president.

The Goldschmidt Thermit Company, New York, has moved its offices to the fourteenth floor of the West Street Building, 90 West street. The company has opened a Pacific Coast branch at 432 to 436 Folsom street, San Francisco, Cal., under the management of L. Heynemann, which will cover the States of California, Oregon, Washington and Nevada.

Metal Market.

NEW YORK, April 10, 1907.

Pig Tin.—Rather more business has been transacted than during previous weeks, yet the market has been more irregular than for several months. The business transacted on April 3 was of good volume, the prices ranging from 40c. to 39.95c. On April 4 a large tonnage was sold, amounting in all to perhaps 250 tons, the greater part of which was done at 39.75c. Later in the day some sales were made at 39.80c.; on this day there were also a number of inquiries for early shipment. Higher prices ruled on April 5, and from 150 to 200 tons were sold at 40.15c. and 40.12½c., the outside price being for spot and the inside for Tin, ex-Minneapolis. On April 8 the price as compared with the London price was easier, and apparently holders were becoming frightened and wished to dispose of the metal on hand. A few sales were made at 40.37½c. and 40.35c. The next day, April 9, the market advanced sharply to 40.90c., but this evidently scared off buyers, as there was but little business done. Taken altogether, the market becomes dull on advances, and the business transacted on declines, while good, apparently, diminishes with each downward turn of the market. Tin was sold on the New York Metal Exchange to-day at 40.85c. This follows a moderate advance in the London market, which closed to-day at £186 15s. for spot and £184 15s. for futures. The arrivals for the first eight days of the month amount to 928 tons, and there are afloat for American ports 2324 tons.

Copper.—The situation in this market is most perplexing. In some ways prices are easier, and on the other hand it is stated that conditions have changed for the better. It is well to point out at this time that the principal if not all offerings of Copper and sales which have been made at concessions in price are of unknown brands, or, to say the least, brands which are not generally known in the markets in which they are sold. Instances of this are the lots of Australian Casting Copper which have been sold at around 23.25c. We learn of a sale of several carloads of remanufactured Copper, in which the conditions of delivery were specified very minutely, and the price obtained was less than 23c. delivered. Continuing the same way, there are offerings made of Electrolytic Copper at around 23.75c., but this also has a string attached to it, part of it being cathodes and part blistered Copper. The fact is commented on in many quarters that it is very difficult to sell Copper to consumers, and this unusual condition is compared with that which prevailed in 1901 when the market broke from 16c. to 11c. Whether the latter part of the comparison will hold good for the present situation or not only the future can tell. Information coming from highest authorities is to the effect that Lake Ingot Copper has sold at 23c. We learn of an Australian brand of Copper, Wallaroo, which is very popular in England and on the Continent, ranking with American Lake Copper, being pressed on this market at 24c. In the absence of business from first hands the market may be nominally quoted at 24.50c. to 25c. for Lake; 24c. to 25c. for Electrolytic, and 23c. to 23.37½c., for Casting Grades. It is undoubtedly true that if any large amount of Copper should be pressed on the market at the present time, concessions from the inside prices would have to be made. On the other hand, it is equally true that small lots for prompt shipment might be sold at higher prices than those quoted above. The refining plants, which were very inactive a month or six weeks ago, are now exceedingly busy, the ore and partially refined Copper which were delayed in transportation having been pushed upon the market, and consequently at the present time there is a very large amount of Copper in the process of refining. The report is heard in more than one quarter that all of the offerings of Copper are being made by houses with strong European connections, and also houses that ordinarily buy Copper in America for shipment to Europe, that an attempt is being made to break the American market by dumping on it Copper which is not wanted in England and the Continent, mainly Casting Grades, in order that Electrolytic Copper can be purchased for shipment to Europe. On the other hand, it is known that these interests are anxious sellers, and are not buying even the higher grades, although they have been offered at concessions. It is only natural that the larger producers in America should refuse to cut the selling price for small lots, as they are already well sold up for May and June delivery, and until the market becomes more settled no one wishes to purchase Copper for delivery during the latter half of the year except at marked concessions. The London market closed steady, at £99 10s. for spot and futures, and £110 for Best Selected.

Pig Lead.—There is an easier tone to the Lead market, and some sales for shipment from the West have been made at 6.12½c. Business has been taken in St. Louis at 5.95c. Spot Lead in New York is also easier and can be had at 6.15c. The principal producer is reported to be making but little headway in the matter of filling back orders, the price to govern outstanding contracts continuing unchanged at 6c. The London market is firmer at £19 17s. 6d.

Spelter.—As far as actual business is concerned, the market is very dull, but for early shipment from the West the price of 6.85c. to 6.95c. rules, and Spelter can be had in St. Louis at from 6.65c. to 6.75c.

Ferroalloys.—The market for Ferrosilicon, which has been ragged for several weeks, has apparently settled down to a more even basis. The recent large sales, which have been made to practically all of the large consumers at prices ranging from $63 to $65, Baltimore, were of Russian Ferromanganese, which usually sells at concessions from English and Continental brands. There is less Ferromanganese offered for sale, and such of it as is offered is held at about $70, Baltimore, for prompt shipment, and $69, Baltimore, for deliveries during the second half. It is possible, however, that concessions will be made from these prices for large orders. The sale of a single carload of 50 per cent. Ferrosilicon was made at around $120, but as this was for spot it does not, of course, represent the market, and future shipments can be had on a basis at $110.

Antimony.—The supply of Antimony continues to increase rather than diminish, the amount of metal arriving being large, and takings by consumers continue to be restricted to immediate requirements. Cookson's is quoted at 24c. to 24½c., Hallett's at 22.25c. to 22.75c., while outside brands can be had at 20½c. to 21c.

Tin Plates.—A better demand is noticeable for both Coke and Terne Plates. Prices are unchanged, at $4.09 f.o.b. New York, and $3.90 f.o.b. Pittsburgh.

Old Metals.—The uncertainty and hesitancy which prevails among the buyers and sellers of Ingot Copper is also observed in the Old Metal market. The business transacted is only for limited amounts, and even this is often on a brokerage basis. We learn, however, of a sale of Old Copper in Ingot form at 22.75c. Under these circumstances the following dealer's selling prices are largely nominal:

	Cents.
Copper, Heavy and Crucible	23.00 to 23.25
Copper, Heavy and Wire	22.75 to 23.00
Copper, Light and Bottoms	20.50 to 21.00
Brass, Heavy	16.00 to 16.50
Heavy Machine Composition	19.50 to 20.00
Clean Brass Turnings	14.75 to 15.00
Composition Turnings	17.50 to 18.00
Lead, Heavy	5.75
Lead, Tea	5.45
Zinc Scrap	5.00

Iron and Industrial Stocks.

NEW YORK, April 10, 1907.

The steel stocks have been notably firm, with an upward tendency, which is ascribed to rumors in circulation that the earnings of the United States Steel Corporation for the current quarter will equal if not surpass the best record for any previous quarter. Conditions in the stock market generally have also been favorable, so that the course of prices has been rather uniformly upward. In some cases notable gains have been made since last Thursday. The range of prices on active stocks from Thursday of last week to Tuesday of the present week has been as follows: United States Steel common 35⅞ to 39⅛, preferred 98¾ to 101⅜; Car & Foundry common, 36½ to 38; Locomotive common 63½ to 66¾; Colorado Fuel, 33½ to 38; Pressed Steel common 35¾ to 38⅜; Railway Spring common 45 to 47; Republic common 26½ to 30½, preferred 84¼ to 87; Sloss-Sheffield common 54 to 56; Tennessee Coal, 142 to 145; Cast Iron Pipe common 36½ to 38; Can preferred, 53½ to 55⅛. Last transactions, up to 1.30 p. m., to-day, are reported at the following prices: United States Steel common 38½, preferred 100¾; Car & Foundry common 38, preferred 99; Locomotive common 65⅛, preferred 107; Steel Foundries common 8½, preferred 39½; Colorado Fuel, 36½; Pressed Steel common 37¾, preferred 94; Railway Spring common 46½; Republic common 30¾, preferred 88; Sloss-Sheffield common 54¾; Tennessee Coal, 145; Cast Iron Pipe common 36⅝, preferred 81; Can common 6⅞, preferred 55.

The American & British Mfg. Company, Providence, R. I., reports gross earnings for the 12 months ended December 31, 1906, of $1,725,478, against $953,771 in 1905; net of $341,071, against $171,283, and surplus after charges of $311,864, against $140,878. The sum of $153,837 was expended during the year for improvements and charged off from plant account and patterns and drawings. President George W. Hoadley says in part: "To provide for necessary improvements and additions at the two plants $150,000 has been appropriated out of surplus earnings. The company suffered a loss by fire December 5, 1906, resulting in the total destruction of the Diesel engine testing department. The material loss is covered by insurance, but the delays and inconvenience suffered will be felt for some little time to come."

The American Car & Foundry Company has issued the following financial statement:

Net earnings for the quarter ending January 31, 1907	$2,307,282.27
Surplus January 1, 1907	16,350,130.70
Total	$18,657,412.97
Less dividends for the quarter ending January 31, 1907	675,000.00
Total surplus, not including February and March earnings	$17,982,412.97

The Canadian Westinghouse Company, Limited, held its annual meeting at Hamilton, Ont., Canada, last month and re-elected the former directors and officials. Net earnings for the year were $346,961, an increase of $126,416. The surplus for the year was $47,411 and the total surplus is $279,452.

President W. R. Brock of the Canadian General Electric Company, Limited, which also owns the entire capital stock of the Canada Foundry Company, in his report to stockholders states that the total profits for the 12 months ended December 31 last were $1,073,675, against $608,207 in the previous year. Deducting interest and discount, a balance for 1906 was left of $1,002,515, out of which dividends were paid amounting to $484,690, leaving a balance of $517,825. From the surplus there was written off $219,553, besides which the directors placed to reserve fund $100,000 and deducted premiums on new stock $220,000, making total deductions of $539,553, resulting in a deficit of $21,728. As the previous surplus was $90,762, the surplus remaining was $69,034. The premium on new stock, above referred to, was received on the issue of 11,000 shares of common stock. The company's reserve fund now stands at $1,800,320 and its contingent fund $100,000. President Brock states that the rapid development of the company's business in all departments made it necessary to enter upon the construction of two new large manufacturing buildings, one at Peterborough and the other at Davenport, which will cost approximately $350,000, exclusive of machine tools.

Dividends.—The United States Cast Iron Pipe & Foundry Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred, and 1 per cent. on the common stock, both payable June 1.

The International Steam Pump Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable May 1.

The Harbison-Walker Refractories Company has declared a quarterly dividend of 1½ per cent. on the preferred stock, payable April 20.

The American Seeding Machine Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable April 15.

The Montreal Steel Works, Limited, has declared a quarterly dividend of 1¾ per cent. on its preferred stock, payable April 8.

The Supply Trade at the Foundrymen's Convention.

The Executive Committee of the Foundry Supply Association held a meeting at Cleveland, Ohio, March 30, attended by the president, S. T. Johnston, Chicago; Henry E. Pridmore, Chicago; U. E. Kanavel, Cleveland; J. S. Smith, Cleveland; H. E. Mills, Syracuse, N. Y.; E. A. Kebler, Pittsburgh; J. S. McCormick, Pittsburgh, and H. M. Lane, secretary, Cleveland. A report was made of the result of a conference with the Entertainment Committee of the Philadelphia Foundrymen's Association. The Philadelphia Association, through its committee, will look after arrangements for entertainment at the May convention, leaving the preparation and conduct of the exhibit entirely to the Foundry Supply Association. The sessions of the American Foundrymen's Association will be open to all who attend the convention, but the entertainment will be confined to members of the American Foundrymen's Association, the Foundry Supply Association, Associated Foundry Foremen, Philadelphia Foundrymen's Association and such individuals as go to the Philadelphia convention to join the Brass Founders' Association, which will be organized at that time. As one object of the Supply Association is to do away with the old irregular practice of soliciting subscriptions for the entertainment fund, the burden thus falling unequally upon members of the supply trade, it was pointed out that members of the Supply Association are not now under obligations to make a separate contribution. The Philadelphia Entertainment Committee, however, it was explained, will feel at liberty to solicit contributions from supply firms not members of the Foundry Supply Association.

From present indications receipts from rentals of exhibit space will be sufficient to cover all the expenses of the exhibit. The secretary reported that up to date 75 firms had sent in applications for membership, and that more than 50 had applied for space, while several applications for membership and space are pending.

A very elaborate paper has been prepared for the American Institute of Mining Engineers by Prof. H. M. Howe of Columbia University, New York, on "Piping and Segregation in Steel Ingots," for presentation at the meeting next week. It is published in full in the March *Bulletin* of the society. Through a printer's error, however, one of Mr. Howe's most important contentions has been made unintelligible. In dealing with "Check Drillings," on page 270, the sentence printed below should have added to it the words in italics, which are omitted in the text as published: "Drillings from each such place shall be analyzed separately, and all the steel of the heat from which said drillings have come shall be rejected in case either the carbon or the phosphorus in said drillings exceeds *by one-third* the limit prescribed for carbon and phosphorus respectively for the ladle test, or in case the sulphur in said drillings exceeds *by two-thirds* the limit for sulphur set for the ladle test."

Milton Furnace of the Wellston Steel & Iron Company, Wellston, Ohio, was blown out for relining on March 27, after having been in blast continuously for 49 months.

Orders for 10,000 tons of rails for the Chicago City Railway Company and 10,000 tons for the Union Traction Company, Chicago, have been placed with the Lorain Steel Company, deliveries to begin at once.

The Hill Ore Certificates Analyzed.

The following statement is said by *At the Market*, a publication issued monthly by Bartlett, Frazier & Carrington, New York and Chicago, to have been specially prepared by one of the greatest authorities on American iron ore deposits:

"The Hill Ore Company certificates would seem to be selling quite above their value, but there is one element that some people are laying emphasis upon apparently, and that is the splendid increase in revenue that will come each year under the contract with the United States Steel Corporation. The Hill people have a very considerable proportion of these lands on leases, while of other portions they own the fee. Their leases are on a royalty basis ranging from 15 to 25 cents. They in turn have subleased to other interests, such as companies operating the Stevenson mine, at 15 to 20 cents. So it is entirely misleading to give the impression that all the ore taken out of the Hill properties carries anything like an 85-cent royalty. As to whether the royalty basis is excessive: I think it is, but that does not matter. The Hill people as the owners of the largest unattached ore properties (I mean unattached to any steel company) asked these prices, and the Steel Corporation agreed to pay them; so what the biggest buyer and biggest seller agree to do fixes a standard.

"As a matter of fact, one lease has been made since the Hill lease, on the basis of $1 a ton. It was not Hill land, though. There is no doubt that ore values were marked up all over the country by the closing of the Hill deal. The basal fact in this whole ore business is that the consumption is tremendous, and the supply of high-grade ores is quite well taken up. So whether we think the basis is excessive or not, we are now on that basis.

"The lease provides that 80 cents of the price the Steel Corporation pays the Hill Company is for rail freight to upper lake docks. Deduct the freight charge, by 1910 the Steel Corporation will be paying more than $2,500,000 for royalty alone, and only four years later it will be paying for royalty alone $6,500,000; so, while Wall street's claim that $4,000,000 or even $3,000,000 will be realized next year is wide of the mark, that amount a year will be realized and very much more within only a few years. Thus the present quotations on these certificates are in anticipation of the rapidly increasing income up to 1917, after which year the amount remains stationary. The gross receipts in 1917 from royalties will be about $9,800,000 from the Steel Corporation alone. Of course, out of this the Hill people will have to pay prior royalties on such of the ore as does not come from fee properties.

"The income the Hill Ore Company receives from mines already active will be only $372,000 next year. This will remain fairly constant, as the Mahoning and Stevenson mines have already reached an annual output that may ordinarily be regarded as their maximum."

The Carnegie Steel Company has started work on the building of a large foundry at its Ohio Works, Youngstown, Ohio. The main building will be 80 x 450 ft. and of steel construction. The foundry will turn out mill castings, ingot molds and ladles, practically all of which will be used at the plants of the company in the Youngstown District. Heretofore all the castings and ingot molds used at the Ohio Works have been shipped from other places.

The William B. Pollock Company, Youngstown, Ohio, has received a contract for all the iron work for the two new blast furnaces to be built by the Carnegie Steel Company at its Ohio Works, Youngstown. The furnaces will be 23 x 90 ft., and will be equipped with eight fire brick hot blast stoves and a 250-ton metal mixer. There will also be built 55 gas producers at this plant.

Daily press reports that the Lorain Works of the National Tube Company at Lorain, Ohio, had closed down for two weeks are untrue. This plant is operating to its full capacity.

Labor Notes.

Henry C. Hunter, secretary of the New York branch of the National Metal Trades Association, represented that association in organizing the New Orleans Metal Trades Association at New Orleans, La., on April 1. The new association starts out with a strong representation of the metal working industries in New Orleans, and expects to add a number of names to its charter membership roll. The firms now members will apply for membership in the National Metal Trades Association, and the local association will probably become the New Orleans branch of the national organization. The officers are the following: President, Lewis Johnson, Johnson Iron Works; vice-president, John H. Murphy; treasurer, Charles Joubert, Payne & Joubert; secretary, Henry M. Stearn.

Representatives of the machinists in New York City and nearby cities in New Jersey who are members of the International Association of Machinists have asked for a conference with the New York branch of the National Metal Trades Association to discuss the demands the union machinists expect to make, asking that they become effective May 1. It is understood that an advance in wages will be the principal feature. About 3000 machinists are employed by the shops represented in the association.

Union molders in New York City and vicinity, it is stated, expect to make no demands this spring. The agreement made one year ago between the Iron Molders' Union and New York City, Newark and Jersey City foundrymen is based on $3.25 a day for coremakers and $3.50 a day for molders.

The lathe hands, 27 in number, employed by the Metallic Drawing Roll Company, Indian Orchard, Mass., have gone on strike because of the refusal of the company to grant a 55-hour week with 60-hour pay, and a general increase of 10 per cent.

Experiments to determine the increase in the weight of roofing tile, when saturated, as compared with the dry tiles, have been conducted in connection with the design of roofs for buildings on the Madras Railway. The tiles were laid over an area of 10 x 10 ft., as they would be on a roof, with and without mortar. The experiments were made with Mangalore tiles measuring 9 x 15 in. x ⅝ in.; flat tiles, 6 x 6 in. x ½ in.; terrace bricks, 5½ x 3 in. x 1 in., and pan tiles 9 in. long. The dry weights of the tiles were 413 lb. for the flat tiles, 786 lb. for the Mangalore tiles, 810 lb. for the bricks, and 2371 lb. for the pan tiles. The increases in weight when saturated were found to be 9.34 per cent. for Mangalore tiles, 11.86 for the flat, 14.76 for the bricks and 16.28 for the pan tiles. With double roofing, consisting of Mangalore tiles over flat ones, the increase was 12.39 per cent. The average increase of weight with saturation, as shown by the entire series of tests, was 13.29 per cent.

Announcement is made that the *Scientific American*, through a desire to co-operate with the work of the American Institute of Social Service, New York, in promoting an American Museum of Safety Devices, will give an annual gold medal to be awarded by the institute for the best device for safeguarding life and limb. The Exposition of Safety Devices, which was held by the institute in New York last month, has been forwarded from the exposition at Chicago, where it was loaned for one week, to Boston, where it will be exhibited during the second week in April.

Arthur T. Rutter & Co., 256 Broadway, New York, announce that they are prepared to receive orders for copper clad iron and steel specialties made by the Monnot process. They have also added to their line of specialties drawn brass moldings.

With a net gain of 164 in 1906, the membership of the American Institute of Mining Engineers on January 1, 1907, was 4048. Of this number 11 were honorary members and 179 associate members.

The Machinery and Metal Club Launched.

The movement to organize a Machinery and Metal Club in New York City was successfully launched at a meeting held on Thursday, April 4, in the Board Room of the Board of Trade and Transportation, when a committee of 28 prominent men in the trade was appointed to form a preliminary organization. The room was crowded with well-known machinery and metal men when the meeting was called to order by F. H. Stillman, president of the Watson-Stillman Company, who organized the movement.

Mr. Stillman pointed out the necessity of organizing a club of the kind proposed. He referred to the fact that other trades have their clubs, and that the purpose of these clubs is for the bringing together of those interested in the trade, so that they may not only become acquainted with one another, but that the club may afford a convenient meeting place for the discussion of business affairs. He added that the metal and machinery interests, which were at one time concentrated in the vicinity of Dey street, had within recent years been scattered almost from Fourteenth street to the Battery, and that the erection of the Church Street Terminal Building afforded an opportunity of consolidating the trade interests. He stated that a large number of firms representing the trade have already taken quarters in the Fulton Building, and that others would follow. Continuing, Mr. Stillman said that the only reason why a club of this character had never been formed was that there was no available building suitable to accommodate it. This objection would be removed by the erection of the Church Street Terminal Building, which would afford commodious quarters. He touched upon the value of such an organization as a convenient mode of conducting business with those outside of New York City, particularly with the foreign trade.

In conclusion Mr. Stillman suggested that a temporary secretary be appointed, and, upon the motion of T. N. Motley, Theodore Waters was nominated as the secretary of the meeting. This motion was carried, and Mr. Waters suggested that a temporary chairman be appointed. George L. Gillon nominated F. H. Stillman as temporary chairman, and the motion was carried unanimously.

Mr. Stillman, upon assuming the chair, suggested that a committee of five be appointed to retire and select the names of 25 or more members who would constitute an Organization Committee. Mr. Gillon moved that the chair appoint this committee of five, and after the motion was carried the chair appointed George L. Gillon, Charles A. Schieren, Jr., Frank Clark, Cohn Ellice and Edwin H. Benners, and the committee retired for the selection of an Organization Committee of 25 members, and during the interim the chair requested expressions of opinion regarding the club.

J. M. Foster stated that in his opinion a vote of thanks should be extended to the person who conceived the idea of the club. Mr. Foster's remarks were heartily in favor of the organization. Henry Prentiss stated that he was strongly in favor of the movement, but declined to accept any office in the club for personal reasons, stating, however, that in other respects he would be ready and willing to assist the club at any time. The chairman stated that just before leaving the office to attend the meeting he had received telephone messages from several prominent men in the trade extending regrets that they could not be present on account of personal affairs, and the chairman also stated that he had received numerous letters from absent members authorizing him to vote for them on any question. F. S. Halsey gave a short address, expressing his hearty approval of the club, and pledged his co-operation. Upon the request of the chairman, K. B. Conger of the Hudson Companies addressed the meeting. In the course of his remarks he stated that Mr. Oakman, president of the Hudson Companies, and Mr. McAdoo, president of the Hudson & Manhattan Railroad Company, were heartily in accord with the movement looking toward the organization of the club, and that he was authorized by them to offer the twenty-first and twenty-second floors in the Fulton Building for the accommodation of the club. Mr. Conger also remarked upon the merits of a roof garden which would be protected with awnings and other inclosures against the sun and rain, and would afford an ideal dining place for club members.

Mr. Stillman asked for an expression of opinion as to the maximum of non-resident members, stating that in his opinion this should be practically unlimited, while the resident membership should be limited to about 750 members. He expressed his opinion that the limits of the resident membership should be within a radius of five miles of the buildings. Others suggested 25 miles and 10 miles.

The Committee of Five returned and reported the selection of the following as constituting the Committee of Twenty-five:

John Derby, Manning, Maxwell & Moore.
James R. Vandyck, Vandyck-Churchill Company.
A. B. See, A. B. See Electric Company.
N. K. Bowman, James Reilly Repair & Supply Company.
Henry Prentiss, Prentiss Tool & Supply Company.
C. A. Hungerford, Morris Machine Company.
Allen M. Rogers, H. A. Rogers Company.
Carl D. Bradley, S. L. Moore & Sons Corporation.
John A. Schroeder, Mesta Machine Company.
C. A. Watrous, Cutler-Hammer Mfg. Company.
George A. Howells, Ingersoll-Rand Company.
H. F. Frevert, Frevert Machinery Company.
Walter L. Pierce, Lidgerwood Mfg. Company.
G. K. Hooper, consulting engineer.
Edwin H. Benners, Crown Casting Company.
Thornton N. Motley, T. N. Motley & Co.
John J. Cone, Robert W. Hunt Company.
George E. Molleson, Tyler Tube & Pipe Company.
H. C. Hunter, National Metal Trades Association.
Fred Stadelman, Wellman-Seaver-Morgan Company.
William Hoxie, Babcock-Wilcox Company.
F. H. Stillman, Watson-Stillman Company.
Theodore Waters, Hudson Companies.
John A. Hill, Hill Publishing Company.
Percy A. Ware, *The Iron Age*.

Mr. Gillon moved that if there were others who were particularly desired on this committee they be named and included, and in accordance the names of W. P. Pressinger, Chicago Pneumatic Tool Company; George L. Gillon, Watson-Stillman Company, and Thos. B. Bryson, Thomas P. Bryson & Co. were added. This constituted a Committee of Twenty-nine.

A motion was passed that F. H. Stillman act as chairman of the Organization Committee, and the meeting adjourned subject to the call of the chair.

The Calumet Steel Company.—A corporation, under the name of the Calumet Steel Company, has just been organized with a capital stock of $275,000, and will have temporary offices at 622 Western Union Building, Chicago. The active management of this enterprise is in the hands of J. H. Porter and S. S. Porter, formerly vice-president and secretary, respectively, of the Buffalo Steel Company, Tonawanda, N. Y., and A. S. Hook, formerly secretary of the Inland Steel Company, Chicago. Mill operations will be in charge of J. J. Worker, formerly superintendent of the Sylvan mill of the Republic Iron & Steel Company, at Moline, Ill. The output will be steel bars, angles and small shapes and will go largely to manufacturers of farm implements, iron bedstead manufacturers and for reinforcing purposes in concrete construction. Announcement of the building plans, location of the plant and details of the organization will be made within a few days.

At the recent convention of the American Railway Engineering and Maintenance of Way Association at Chicago the Committee on Iron and Steel Structures reported that it had investigated and discussed the advisability of changing the desired ultimate strength of structural steel from 60,000 to 62,000 lb., and the propriety of lowering the phosphorus limit in acid steel castings from 0.08 to 0.06 per cent. The committee was not ready, however, to recommend any change in the standard specifications of the association for steel railroad bridges which cover these features.

The Machinery Trade.

NEW YORK, April 10, 1907.

The statement of President C. A. Coffin, "that business with the General Electric Company is as good to-day as it has ever been in the history of the company," also applies with considerable accuracy to a majority of machinery houses in this territory. These latter are taking all the orders they can conveniently take care of, there being no noticeable recession in business as yet. For some time there has been a feeling among the more important manufacturers that there will be some slackening in trade as the year advances, but it is believed in some quarters that trade will not be materially affected, at least for some time to come. This view is held by many because of the constant influx of orders and the very few cancellations. The greater portion of business the past week was placed by industrial companies, the railroads having not as yet come into the market for large lots of tools. The exception, of course, is the Pennsylvania Railroad, on whose large list bids are being received. In addition to the large shops planned and already reported in these columns, many other railroads are preparing to erect shops, the combined mechanical requirements for which will be large.

It is stated that the Philadelphia & Reading Railroad is planning the erection of new shops at St. Clair, Pa.; the St. Louis & San Francisco Railroad has appropriated $1,000,000 for the purchase of land and the erection of new shops at Evansville, Ind.; the Atchison, Topeka & Santa Fé Railroad intends to build an extensive addition to its shops at Albuquerque, N. M.; the Central of Georgia Railroad has secured property and will break ground within the next few weeks for its large shops at Macon, Ga., and the Northern Pacific Railroad is to build new shops at Helena, Mont., which will include a main building 60 x 120 ft.

The large demand for electrical machinery is shown from the reports from the two leading interests. The General Electric Company is doing as large a business as it has ever done, and among recent orders is one for electrical machinery aggregating $1,000,000 in value from a Japanese paper company. The orders received by the Westinghouse Electric & Mfg. Company during March represent a greater value than the business of any month in the history of the company, aggregating over $4,000,000. It is said that there are now sufficient orders in the various departments of the company's East Pittsburgh works to keep the shops fully employed for the remainder of the year.

The size of the assemblage and the sentiments expressed at the meeting to form a Machinery and Metal Club last Thursday, as set forth elsewhere in detail, demonstrated that an organization such as that proposed, will meet the favor of the large majority of men in the trade. The meeting place was crowded with prominent machinery men, and the sentiments expressed were entirely in favor of forming the organization. F. H. Stillman, who organized the movement, now has over 300 names of well-known machinery and metal men who will be willing to join the club, and there is every reason to think that more than the required number of members will be secured by the time the organization is completed.

Ingersoll-Rand Company Expanding.

The Ingersoll-Rand Company, 11 Broadway, New York, has decided to issue 3000 shares of new preferred stock, which is to be used in acquiring new property and in making additions to the company's present plants. It is expected that the company will shortly need considerable machinery in order to carry out its projects. Plans are now being drawn for a foundry to be added to the plant of the Imperial Engine Company at Painted Post, N. Y., some additions are to be made to the machine shop at that plant and perhaps to the power and other equipment. The foundry will have a capacity of about 50 tons, and from all accounts no purchasing has been done for this improvement. The company is also contemplating, it is understood, some additions to the Canadian Rand Company's plant, and the entire capital stock of the Imperial Pneumatic Tool Company, of Athens, Pa., is to be acquired, after which that plant will be about doubled. At present a general line of pneumatic tools is being manufactured at Athens and about 150 men are employed. It will be remembered that several weeks ago the Ingersoll-Rand Company purchased about $30,000 worth of machine tools for its Athens plant. It is thought that the proposed addition to the Imperial Engine Works has not been provided for, and it is expected that more buying will be in order shortly.

The National Producer Gas Power Company, which was recently organized under a New Jersey charter with $500,000 capital, has acquired an existing plant at Emmet street and Avenue D, Newark, N. J., and will shortly engage in the manufacture of gas engines and producer gas plants. The company has been successfully manufacturing gas engines in England for some time, and is marketing a 50-hp. engine which is particularly adaptable, it is claimed, for marine work. The American company organized with J. R. Wilmot, inventor of the engine, as president and general manager; Major W. S. Stewart, secretary-treasurer, and H. R. Lounsbery, Jr., assistant manager. The directors consist of Mr. Wilmot, Major Stewart, J. R. Tennant of the Commercial Trust Company of New Jersey, and H. J. W. S. Cooke of the Merchants' Refrigerating Company of New Jersey. It is the new company's intention to equip its plant in Newark as rapidly as possible, and the machinery will probably be purchased for that purpose very shortly. The company will require some planers, lathes and other machine tools, as well as a complete foundry equipment. No power will be needed, as it is expected the machinery will be operated by engines of the company's own make. Pending the equipment of the plant, orders will be filled from the British works of the company, which have been in successful operation for some time. The company has opened a New York office at 1123 Broadway.

Within a short time the Keystone Driller Company, Beaver Falls, Pa., will come into the market for considerable machinery for equipping its new buildings. Some time ago the company purchased a large tract of land adjoining its present property, on which it intends to erect several new buildings, to include a complete steel foundry. At the present time the company does not know just what it will require in the way of mechanical equipment, as the details have not been worked out, but a little later the company will be in the market for boilers, engines, cranes, industrial railway equipment and foundry supplies.

The Alabama Consolidated Coal & Iron Company, Birmingham, Ala., has authorized the expenditure of $100,000 for making improvements to the property, which will include the erection of two machine shops. The interests controlling this company contemplate the erection of large shops in the Birmingham District, which, if built, will call for the purchase of a large amount of mechanical equipment. In addition to the Alabama company's plant, these include the erection of locomotive works to cost about $3,000,000.

It is understood that the plant which the American Brake Shoe & Foundry Company intends to erect at Chattanooga, Tenn., will be one of the largest of the kind in the country. Plans now prepared, it is said, call for a main building, 150 x 300 ft., which is to be located on a site about 14 acres in extent, which the company recently purchased. The company has had some inquiries for machinery in the market of late, but it is not thought that the actual buying of the equipment for the plant has been begun. A short time ago a few purchases were made in the machinery trade by this company, but that was for installation in the plant at Mahwah, N. J., which is now running to full capacity. The Chattanooga plant will take care principally of the company's Southern business, and a general line of railroad supplies will be manufactured there.

The Union Forging Company, Union, N. Y., which is to enlarge its capacity for the manufacture of vehicle forgings and which desires catalogues from manufacturers of machinery for such work, contemplates the installation of a new engine, boiler, some lathes, spindle drills, &c.

Engines and other equipment are required by the Radial Bearing Company, Trenton, N. J., which has been organized by capitalists of that city, and which will erect a plant for the manufacture of radial bearings, the invention of William J. Brewer, 25 Bellevue avenue. The new device is practically a roller bearing which, it is claimed, can be applied to every kind of machine or vehicle.

Quite a little machinery is required by the Lunenburg Foundry Company, Limited, Lunenburg, N. S., which was recently organized with a capital stock of $50,000, and which will install a plant for the manufacture of stoves and ranges, hot water boilers, hot air furnaces, and to do general foundry work. A machine shop will be installed in connection with the foundry. The company will require one 18 in. x 10 ft. engine lathe, one 40 x 20 in. gap lathe, one 30 x 30 in. x 6 ft. planer, one 30-in. upright power drill and other machinery. Some pattern shop equipment is also desired. Second-hand machinery is preferred, if in good order.

E. Ronceray, of the firm of Ph. Bonvillain & E. Ronceray, large tool importers and manufacturers of molding machines, Paris, France, will leave Havre on April 13, for the purpose of visiting machine tool manufacturers in this country, with a view to arranging connections for the sale of American machine tools in Europe. Mr. Ronceray will attend the meeting of the American Foundrymen's Association at Philadelphia, May 20 to 24, to exhibit a molding machine manufactured by his firm.

Business Changes.

The Roteng Engineering Corporation, New York, has moved its office from 299 Broadway to 20 Vesey street. The company has about completed the installation of the equipment in its new quarters in the Bush Terminal Building No.

2, Brooklyn, and expects to have the plant in operation in about a week.

The Goubert Mfg. Company, New York, has moved its offices to 90 West street.

Owing to the rapidly increasing business in electric motors and generators in Birmingham, Ala., from its New Orleans and Baltimore offices, the Crocker-Wheeler Company, whose main office and works are at Ampere, N. J., has been obliged to establish headquarters in Birmingham. The company's rolling mill motors, which are built especially for arduous service, have been in great demand in the Birmingham District. The new office, which is in the Woodward Building, is in charge of B. A. Schroder, who hitherto has been in charge of the New Orleans territory.

New England Machinery Market.

WORCESTER, MASS., April 9, 1907.

The machine tool business of the past week, as reported by the Boston dealers, has developed no change in regard to volume of orders, but a return of full confidence in the general business situation is noticeable. The talk that a general falling off of demand might be expected has dwindled to nearly nothing. Customers are proceeding with their extensions and improvements in what they believe to be well grounded assurance that additional manufacturing facilities will be required to take care of their future orders. Here in New England it is apparent that a few pessimists started a good deal of idle comment on the possibility of a break in the market. This has now died out. The writer has talked with many dealers and manufacturers during the past fortnight, including men in other lines than machine tools and kindred equipment, and not one has stated his own business to have shown any falling off.

The machine tool people have been making careful analysis of the situation of their business, with results which might not be apparent at first thought. To start with, deliveries are no better than they were when the new year began, and in some cases they are worse than ever. The last month, which had been looked upon as a critical period, bound to show up any weakness in the market, has seen no change for the better in promised shipments. During the past week delivery sheets have been sent out by manufacturers showing a scarcity of tools for delivery during the next six months which is more pronounced than ever, and machines which had reached even later delivery have disappeared from the lists, denoting sales to customers who can certainly feel naught but confidence in the next two or three years.

In considering this condition it should be remembered that production of machine tools has increased greatly since a year ago. A most conservative estimate of this increase is 25 per cent., and probably the aggregate is somewhat above that figure. Not only have works been enlarged and equipments increased, but lines have been simplified in order to concentrate production on those types and sizes for which the demand is most urgent, and shop organization has been developed and perfected to an almost astonishing extent, a no small factor of production in itself. Yet in face of a volume of output of machinery which has been growing constantly and which is still growing, the shops have been wholly unable to make any gain on deliveries, with a few exceptional instances, which are more than counterbalanced by those other cases where demand has continued to be in excess of production. Perhaps, on the whole, the works which build machine tools and other similar equipment are now producing at a rate nearly equal to the volume of orders. Business pending, if it materializes as expected, will have an important effect upon delivery sheets, it is said.

W. P. Ross, Cleveland, has been made New England manager for the Standard Tool Company, Cleveland, filling the vacancy caused by the resignation of Frank J. Howell, who has been made general superintendent of the Elliott Company, manufacturer of addressing machines, Boston.

The Eastern Steel Casting Company, 696 East First street, South Boston, is to build an addition to its foundry, 75 ft. square, doubling its capacity.

The Snell Mfg. Company, Fiskdale, Mass., is building an addition to its ship auger factory at East Brookfield, 30 x 30 ft. and three stories. The increase in the business of this department makes necessary these larger manufacturing facilities.

A very large aggregate of new building is contemplated by the textile mills of New England, and the total in the shoe manufacturing trade will be no small one. The manufacturers and dealers in mill supplies will have a large market; a considerable amount of power equipment will be needed, though in many cases additions are not large enough to require new power units, and repair shops will require a fine aggregate of machine tools. The shoe shops do not buy much machinery, for most of them use the machinery of the United Shoe Machinery Company under leases which carry with them full repairs of all machinery. But the textile mills when they are new must equip repair shops. They do not require the highest class of machinery, as a rule, and are frequently satisfied with second-hand tools when they can be had. To-day the second-hand tool market is pretty well depleted, which means the purchase of new machinery.

The Massachusetts Legislature has referred to the next General Court the bill authorizing the city of Boston to establish a municipal electric lighting plant. This is equivalent to a defeat of the measure, the procedure adopted being considered a polite way to dismiss legislation.

The shops of the Corwin Mfg. Company, Peabody, Mass., have been leased to the Machine Sales Company, 68 William street, New York, of which Casimir Von Philp is the president. The company manufactures all classes of small machinery, continuous printing presses, automobile engines, auto cars, miscellaneous iron castings, brass, bronze and aluminum castings, kerosene oil engines and any class of machinery in quantities for outside parties. The company is now equipped to deliver at short notice all classes of machinery up to a weight of 6000 lb. for any single piece contained in the machine. It is understood that H. S. Corwin retires from the business at Peabody. It will be remembered that the Corwin Company took the kerosene engine business of the International Power Vehicle Company, Stamford, Conn., over a year ago.

The plant of the Pittsfield Spark Coil Company, Pittsfield, Mass., will be removed to Dalton, Mass., where it will occupy a factory building the property of United States Senator W. Murray Crane and his brother, Zenas Crane. These two gentlemen have purchased a one-half interest in the Pittsfield Spark Coil Company, and the plan is to considerably enlarge the plant and its output, increasing the number of hands employed from 100 to 200. The building at Dalton has been occupied as a shoe factory. The new tenant has taken a five years' lease of the premises. It is expected that the removal will be accomplished by July 1.

The Franklin Moore Company, Winsted, Conn., manufacturer of bolts and the Acme chain hoist, is completing an addition to its foundry, 43 x 53 ft., one story. The equipment has already been purchased.

In connection with the purchase of the car building business of the Wason Mfg. Company, Springfield, Mass., by the J. G. Brill Company, which was announced in *The Iron Age* of last week, it is stated that there will be no change in the name of the Wason Company nor in the plant or the class of work. The Springfield plant is very busy, large orders being in hand requiring a working force of 480 men. The holdings of the J. G. Brill Company, which was recently organized with capital stock of $10,000,000, now include the J. G. Brill Company, American Car Company, St. Louis; John Stevenson Company, Elizabeth, N. J.; G. C. Kuhlman Company, Cleveland, and the Wason Mfg. Company.

The new building of the Locomobile Company of America to be erected at Bridgeport, Conn., already briefly mentioned in this column, will be 54 x 150 ft., with four stories and basement. The experimenting and drafting departments will occupy the first floor, the offices the second floor, and the third and fourth floors will probably be used for the assembling and finishing departments, though this is not fully determined. The building will cost about $50,000.

The Union Hardware Company, Torrington, Conn., manufacturer of skates, gun implements and hardware specialties, is to erect a new building, contract for which has been awarded. It will be of brick, mill construction, 100 x 150 ft., with ell 40 x 60 ft., and two stories throughout. The company has just purchased the business of the Bridgeport Gun Implement Company, Bridgeport, Conn., and will add these lines of gun implements to those already manufactured.

The Jenckes Paper Box Company, Providence, R. I., is to erect a large addition to its plant, consisting of a building 60 x 235 ft. and two stories, with ell 23 x 62 ft. The company is in the market for electric lighting equipment, automatic sprinklers, &c.

The Industrial Realty Company, Hartford, Conn., has acquired of the International Silver Company the manufacturing property at Market and Temple streets, comprising about 40,000 sq. ft. of floor space, and will rent to manufacturing concerns. Important improvements have been made to the property, and some tenants are already established. The Industrial Realty Company has been incorporated. with a capital stock of $50,000, to make a specialty of renting space for manufacturing purposes. The incorporators are E. H. Warner, H. J. Bloomer and J. F. Coombs, all of Hartford.

The Foundry Equipment Company, Worcester, Mass., has been organized, with a capital stock of $20,000, to manufacture molding machines and plate and other foundry equipment. Edward E. Waite is the president, William B. Scofield treasurer and George Crompton clerk, these officers, with Edward D. Thayer and Randolph Crompton, constituting the Board of Directors. The company will begin its industrial existence with the manufacture of a new molding machine and plates, and later on will take up a general line of foundry equipment. The works will be located in

Worcester, but no decision has been reached as to exact location, &c. The officers are prominent Worcester business men, Mr. Thayer, Mr. Scofield and the Messrs. Crompton having been the owners and officers of the large Crompton & Thayer Loom Works, which was recently merged into the Crompton & Knowles Loom Works. Mr. Thayer is one of the largest manufacturers of woolen goods in New England.

The Geometric Tool Company, New Haven, Conn., manufacturer of special machinery and tools, is making important improvements at its works, which have already been mentioned briefly in this column. The three-story brick building is being entirely remodeled to give nearly three times the present floor space. A brick addition to one of the factory buildings will be used as a boiler room. New power equipment is being installed, consisting of a suction gas producer purchased of the Smith Power Company, Lexington, Ohio, and Westinghouse engine and generators and motors. All other equipment has been ordered, and the company expects to begin installing it by May 1.

The F. E. Reed Company, Worcester, Mass., manufacturer of machine tools, is to erect a new building of large dimensions which will be devoted to storage and erecting rooms. Considerable floor space in the present buildings will be released for manufacturing purposes.

The R. Wallace & Sons Mfg. Company, Wallingford, Conn., manufacturer of silverware, is to erect a new four-story building, 60 x 80 ft., to be used primarily for stamping purposes.

Chicago Machinery Market.

CHICAGO, ILL., April 9, 1907.

That there has been some falling off in the volume of inquiries and sales in machinery lines is generally granted by dealers in this market. Specific instances are known where formulated plans, involving the purchase of large machinery equipments, have been halted and are now held in suspension awaiting future developments. Notable among these is the list of tools and machinery submitted for bids some weeks ago by the Pullman Company, none of which, it is understood, has yet been bought. A feeling of conservatism, primarily inspired by the belief that an unsafe momentum was being reached in trade movements, and further strengthened and confirmed by sinister reports from the stock and money markets, has without doubt been productive of hesitation. On the other hand, the conditions created by a demand far outstripping production have of themselves automatically operated to check buying. In evidence of this salesmen report that many plants are now in urgent need of tools and machinery for which orders would be placed at once if they could be had without delay, but there is a growing disinclination to buy for delivery months ahead, as is now necessary. It is but natural that inability on the part of dealers to furnish goods within reasonable time should discourage present buying, and the lessened activity noticed is therefore traceable, in part at least, to this cause. Trade on the whole is, however, satisfactory, and whatever quietness is observed is only comparative and cannot be characterized as positive dullness. It is believed that when the disturbing rumors of cancellations by the railroads and other large interests are cleared up, and the facts as to their extent are fully known, some pending closures that have been held up out of apprehension will be carried to completion.

Notwithstanding the bridge and structural steel works of the Morova Construction Company, Eighty-fifth street and Stewart avenue, Chicago, has been doubled in capacity during the past year by the addition of a new shop, 100 x 168 ft., fitted with all modern overhead appliances, and tools for heavy riveted work, present demands call for further extensions, which are now under advisement. The addition contemplated will add at least 50 per cent. to the present output, which is now 2500 tons per month. Foundations are now being placed for a runway in the unloading yard, upon which will be erected a crane with 84 ft. span and two 10-ton trolleys, which equipment has already been purchased. A 100-kw. Westinghouse generator has been recently installed, but plans for the machinery equipment of the proposed addition have not been formulated.

The Lowith Bros. Iron Works Company, Denver, Colo., has been organized for the purpose of selling and manufacturing ornamental iron and steel work for buildings. The equipment for its plant is not yet complete, and the company is now in the market for several shears and punching machines.

The J. L. Robertson Machine Company, Paris, Ill., now has in the course of erection a machine shop, 40 x 100 ft., built of concrete blocks, which it is expected will be completed by May 1. In addition to machinery already contracted for, the company is now in the market for one universal milling machine, one 14 or 16 in. lathe and one drill press.

The American Steam Pump Company, Battle Creek, Mich., has secured a contract to furnish the Artesian Water Company, Memphis, Tenn., a deep well pumping equipment with a capacity of 5,000,000 gal. per day of 24 hr. The water supply will be furnished from 10 10-in. deep wells. Each pair of wells will be taken care of by a rotative compressor of 500 cu. ft. per minute. These compressors will be of the Worthington type, manufactured by the International Steam Pump Company. The main pumping plant will consist of five compound single piston pumps of 1,000,000 gal. capacity each, giving a total capacity of 5,000,000 gal. per day. Taken in connection with the 30,000,000 gal. deep well pumping plant now operated, it is believed that with the additional capacity supplied by the new equipment Memphis will have the largest deep well pumping plant in the country.

The Chicago House Wrecking Company, Thirty-fifth and Iron streets, Chicago, has recently purchased the extensive plant of the Goyer Alliance Refining Company, Belle Alliance, La., and will at once begin the dismantling of the plant and assorting its material preparatory to putting it on sale.

Business Changes.

The Chicago offices of the Kewanee Boiler Company, Kewanee, Ill., now at 167-169 East Lake street, will on or before May 1 occupy a handsomely fitted office and display room at 35 Michigan avenue.

The Marshall & Huschart Machinery Company, Chicago, has established an office and salesroom at 109 Kentucky avenue, Indianapolis, Ind., where a full line of machine tools and machinery will be carried. G. C. Edwards will be the representative in charge.

The Pratt & Whitney Company, now at 46 South Canal street, will on May 1 occupy offices with the Niles-Bement-Pond Company in the Commercial National Bank Building, corner of Clark and Adams streets, Chicago. Warehouse and storage rooms for the combined use of these companies will be established in the Plamondon Building, Clinton and Monroe streets.

The demand for new quarters by occupants of Machinery Row, a large part of which must be vacated within the next few months to make way for the new Northwestern Depot, heretofore referred to in these columns, has resulted in plans for a new eight-story building at Washington and Clark streets, for the exclusive use of machinery interests. The three-story Edgecomb Building, now occupying that site, will be extended and five stories added to its hight, and when completed will contain 140,000 sq. ft. of floor space. The new structure will be called the Iron and Steel Machinery Building, and will be handsomely finished throughout in mahogany and marble. Several new features are included in the plans, which are designed to afford every convenience to the tenants. The fourth, fifth and sixth floors will be arranged for and devoted to the exhibition and display of machinery. These rooms will have no partitions, but will be provided with platform and railed divisions suitable for the various kinds of tools and machines to be shown. It is expected that outside manufacturers will avail themselves of the opportunity afforded for the permanent display of their product, which can be shown on these floors without the expense of a personal representative. The management of the building will provide attendants for the exhibition rooms, and will assume the entire expense of their care and maintenance, charging rental for space occupied. For the use of tenants and members of the West Side Business Men's Club the seventh floor will be fitted up for a clubroom, and will contain a dining room, barber shop and suitable waiting rooms. An individual steam power plant will be installed for the generation of electric current to operate a freight elevator and other power required by tenants throughout the building. Besides a lighting plant, capable of furnishing abundant illumination throughout the building, the electrical equipment will consist of one freight elevator, 12 x 15 ft., with lifting capacity great enough to carry the heaviest machines. Two passenger elevators will also be installed. The type of boilers and other details of the power plant have not yet been worked out, but will be made known in the near future. A number of firms have already contracted for space, among which are the H. A. Stocker Machinery Company, who will occupy two stores and basement on the Washington street side of the building; Nelson & Kreuter, laundry machinery; Standard Gauge Mfg. Company; National Acme Mfg. Company; Vulcan Crucible Company; Thatcher Mfg. Company; Bordwell & Barton Company, and the United States Gauge Company. Negotiations for space are under way with a number of other important machinery firms, which will in all probability be closed at an early date.

The McMaster-Davis Supply Company, Chicago, dealer in mill, mining and steamboat supplies, has secured new quarters at 174-176 East Lake street, to which location it will move about May 1. The new storerooms will afford largely increased space and better warehouse facilities, which were imperatively demanded by the company's growing business.

Philadelphia Machinery Market.

PHILADELPHIA, PA., April 9, 1907.

Conditions in the local machinery market show considerable improvement. A much better buying movement started in directly after the first of the month, and orders in many cases were booked with more freedom than has characterized business for some weeks. The volume of business closed during the month of March was not very satisfactory to sellers of machine tools, and in the aggregate showed a decline over the previous month. Tool builders, however, have not been exercised over the falling off in new business. Plants have been fully occupied and the tax upon producers to meet the demands of their customers has been very heavy, so that a slight let-up in new business will enable at least some of them to catch up slightly, or in any event permit of some straightening out of the business already in hand. General conditions have also improved and the trade takes a more optimistic view of business prospects. The undercurrent is decidedly better, and it is now the pretty general opinion that business will get down to what are termed normal conditions; that boom conditions will disappear and that a fair volume of business will be transacted throughout the year. The recent weakening in conditions, however, was not without its benefits, inasmuch as it checked any unhealthy growth of business and brought about a closer observation of conditions and the adjustment of affairs to meet those conditions.

Local merchants and manufacturers report quite a fair number of orders. Practically all the business placed has been of the single tool variety, covering a fair range of tools of the medium and lighter types. A few sales of tools of the heavier types, as well as special tools are also to be noted. Inquiries are fairly numerous and have slightly increased, but are confined to single tools and small lots. Several large specifications for tool equipments are still before the trade, and one of these at least is expected to close almost any day. The railroads are not making any extensive purchases. The Baltimore & Ohio has a number of additional specifications for tools before the trade, while the Pennsylvania also has a small list out. As far as can be learned, however, no purchases have yet been made against these lists.

There is still a good export demand for special tools, and builders of such equipment continue to book a fair amount of business. Inquiries for the standard lines of machine tools have not been very numerous, and manufacturers are not seeking export business in these lines very aggressively, owing to the extended deliveries made necessary by the large volume of domestic business on hand. The export demand for power equipment and power transmission specialties keeps up satisfactorily, and manufacturers are booking a seasonable amount of business.

The demand for engines and boilers continues fairly active. Some fairly large propositions are under consideration, but business is generally slow in closing. Second-hand boilers and engines are not as active as the trade would like; still, a fairly good business is being transacted.

Wickes Brothers, boiler manufacturers, engine and machinery merchants, who recently discontinued their warerooms at 605-607 Arch street, in this city, have moved their offices from that address to 1029 Drexel Building, Fifth and Chestnut streets. W. J. Linton continues as local manager.

The Hess Machine Works, manufacturer of file making machinery, reports an increasing volume of business. The export demand continues good, while that from domestic customers has improved materially, particularly from those located in New England and the Middle West. Five sets of file making machines have recently been shipped to Russia, and three sets to Germany. Several sets have also been shipped to England, while orders are in hand for eight sets for France. A number of deliveries on domestic orders have also been made to both Eastern and Western file manufacturers.

I. H. Johnson, Jr., & Co., Incorporated, continue busy. A good demand is noted for lathes of all sizes, particularly those of the heavier types as well as larger sizes. Orders have been booked for several 42, 48 and 60 in. motor driven tools, as well as large numbers of those of the smaller sizes. The business transacted during the first quarter of the year compares very favorably with that of the same period last year, and the outlook for future business is considered quite satisfactory. Deliveries recently have been largely of the medium sized tools, although one 60-in. motor driven lathe weighing over 60,000 lb. was recently shipped to a nearby customer.

The Birdsboro Steel Foundry & Machine Company, Birdsboro, Pa., notes an increased demand for tin plate plant and skelp mill equipment, such as steam doublers, doubling and squaring shears, bending and straightening rolls, housings, &c. Business generally has settled down to a more steady character, and while the demand for material of a miscellaneous character is less, that for material and machinery in certain particular lines appears to have increased. The steel casting department is exceptionally busy, and two additional Wagner cold saw cutting off machines, of the largest design, have been installed to relieve the pressure of work. Among the orders of note recently received was one for four large engine cylinders for the battleship Michigan. One of these, weighing 35,000 lb., has already been delivered. This company also reports a good foreign demand for its Jackson belt lacing machines.

Cincinnati Industrial Notes.

CINCINNATI, OHIO, April 9, 1907.

The Cincinnati Planer Company, Cincinnati, Ohio, has broken ground for its new plant at Oakley, a suburb of Cincinnati, where it has secured 8 acres of ground. The first building will be 140 x 200 ft., of brick and steel construction, which will be equipped with new machinery throughout and which will be operated as an addition to the present plant, the intention being to build all the larger sizes of planers in this new plant. A second building, 140 x 200 ft., will be constructed, after which the entire plant will be moved to the new location. Several other well-known machinery manufacturers, including the Cincinnati Milling Machine Company, Bickford Drill & Tool Company and the Triumph Electric Company, are building plants in the same locality. A central power company, owned by these four companies, will furnish light, heat and power to the several plants.

E. H. Lunken, president of the Lunkenheimer Company, Cincinnati, Ohio, will head a new organization, incorporation papers for which are now being prepared, for the purpose of engaging in the manufacture of pressed steel window and door frames, of which Mr. Lunken is the inventor and patentee, and which will be produced in a portion of the five-story brick building formerly occupied by the Cincinnati Screw & Tap Company. The new organization will be known as the Lunken Steel Company.

The growth of the Lunkenheimer Company, Cincinnati, Ohio, has been such as to necessitate the purchase of additional property and buildings adjacent to its present plant, consisting of a large five-story brick structure, formerly occupied by the Cincinnati Screw & Tap Company and which has been unoccupied since the latter removed to Loveland, Ohio. The building has a frontage of 200 ft. and an irregular depth, and the tract of land immediately adjoining the south side has a frontage of 400 ft. on Beekman street, extending back to the Cincinnati, Hamilton & Dayton Railroad tracks, while the south line extends to the Westwood steam road. Through these two purchases the company becomes the owner of property having a total frontage on Beekman street of 900 ft. Contracts are about to be let for a new concrete structure, 100 x 300 ft., south of the present plant, with frontage on Tremont street, which will be devoted exclusively to the production of valves and other engineering specialties, to cost $200,000. The company contemplates the erection of other buildings on the property early the coming year.

The Cincinnati Shaper Company, Elam street and Garrard avenue, Cincinnati, Ohio, has had plans drawn for an addition to its present plant, 92 x 100 ft., two stories, to be used for machine shop purposes. Work of erection will be commenced at once.

The pipe covering building to be built by the Phillip Carey Mfg. Company, Lockland, Ohio, will be erected at once at a cost of $90,000. The building will be three stories high, 90 x 400 ft.

The F. H. Lawson Company, manufacturer of tin and stamped ware, one of whose warehouses was recently destroyed by fire, is, through its architects, receiving bids for the erection of a three-story addition, 40 x 65 ft., to its main plant, of fireproof construction. Other buildings, of which plans are now being prepared, will be erected in the near future.

The company which is to erect the new blast furnace at Hamilton, Ohio, referred to in these columns, will effect a permanent working organization on April 10, with the following principals: Edwin N. Ohl, Geo. L. Pearson, W. R. Todd, R. E. Field and F. F. Dinsmore. At that time plans will have been complete and work of erection begun. The company has secured a tract of 90 acres at Kokeotto, 2 miles north of Hamilton, Ohio, and adjacent to the property and plant of the Hamilton Gas & Electric Company, whose capacity for producing coke will at once be increased from 150 to 300 tons in order to supply the furnace, which latter will give employment to about 175 men.

The new home of the Hisey-Wolf Machine Company, Cincinnati, Ohio, will be located on a tract of ground 168 x 265 ft., bounded by Township street on the north, Cormany street on the west and the Miami Canal on the east. The main building will be three stories in hight, of brick and mill construction; an office and drafting building, two stories, 20 x 50 ft.; power plant, 40 x 60 ft. Ground will be broken at once, as plans have already been prepared, and it is ex-

pected the buildings will be completed and ready for occupancy by September next. Some additional equipment will be required. The company has been compelled to erect its own plant owing to the increased demand for its products, portable electrical drills and grinders. This will be the second move within six years and will increase its productive capacity over 300 per cent., besides enabling it to bring out several new tools which have been pending for some time owing to the present inadequate facilities.

The Cincinnati Punch & Shear Company has materially increased the capacity of its plant by the addition of a larger boiler and engine. This will allow the vacant space of the plant to be utilized by the installation of a number of new machines, which will be done as soon as practicable. Trade continues very heavy, both from foreign and domestic sources, and with the increased facilities it is anticipated that deliveries can be made much more promptly.

The Nugent Tool Company has been incorporated with a capital of $10,000 by Richard C. Nugent, Neale P. Riley, R. B. Tyler, Dwight S. Marfield and Chas. H. Holmes. A location has been secured at 2163 to 2167 Central avenue, this city, where the new concern will make a specialty of the Economy friction clutch. A complement of tools, including lathes, shapers, drill presses and other necessary machinery, has been secured, and the work of installing the plant is now under way. R. C. Nugent, the designer of the new clutch, is general manager and superintendent, and R. B. Tyler is president. In addition to the manufacture of friction clutch pulleys, the company will make collapsing dies, taps and special machinery. It starts out with a number of orders on its books, and it is anticipated that expansion will be necessary at an early date.

Sealed proposals will be received at the office of the Board of Trustees, Commissioners of Water Works of the city of Cincinnati, until 12 o'clock noon of May 7, for furnishing and delivering a locomotive, 22 coal cars and eight ash cars, for furnishing and laying a concrete floor in the pump pit, completing valve chambers Nos. 1 and 3, and for furnishing and placing an electric hoist in the pump pit shaft at the River Pumping Station near the village of California, Ohio.

Government Purchases.

WASHINGTON, D. C., April 9, 1907.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until April 23 for motor, radial drills, pumps and other supplies for the Eastern navy yards.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until April 23 for the following machine tools for the Portsmouth, Boston, New York, League Island and San Juan navy yards: Schedule 591, bending rolls, wheel press, 10-ton locomotive crane; schedule 592, punch and shear, flue cleaning machine.

The Isthmian Canal Commission will receive bids until April 19, Circular No. 359, for rock crushing plant, engine, dynamo and other supplies.

The following bids were opened April 2, Circular No. 356, for supplies for the Isthmian Canal Commission:

Bidder 2, James Beggs & Co., New York; 4, Blaisdell Machinery Company, Bradford, Pa.; 12, Chicago Pneumatic Tool Company, New York; 23, D'Oiler Engineering Company, Philadelphia, Pa.; 29, General Electric Company, Schenectady, N. Y.; 36, Ingersoll-Rand Company, New York; 40, Laidlaw-Dunn-Gordon Company, New York; 48, Mosher Water Tube Boiler Company, New York; 50, Manning, Maxwell & Moore, New York; 51, National Electrical Supply Company, Washington, D. C.; 59, Platt Iron Works, Dayton, Ohio; 62, James Reilly Repair & Supply Company, New York; 81, Henry R. Worthington, New York; 95, A. D. Granger Company, New York; 98, A. L. Ide & Sons, New York; 101, E. Keeler Company, Williamsport, Pa.; 104, Motley, Green & Co., New York; 110, Sprague Electric Company, New York; 115, Williamson Bros. Company, Philadelphia, Pa.; 116, Western Electric Company, New York; 117, Westinghouse Electric & Mfg. Company, Baltimore, Md.; 123, Southern Exporting Company, New Orleans, La.; 124, J. Edward Ogden, New York.

Class 1. Air compressor, generator engine, switchboard, condenser, service pumps, &c.—Bidder 2, item 7, $205, 30 days; 4, item 1, $3227, 90 days; 12, item 1, $3937 and $4087, 90 days; 23, $29,548 and $28,134, 105 days; 29, item 2, $3480, item 3, $298, 130 days; 36, item 1, $5508 and $5604, 168 days; 40, item 1, $4925, 150 days; 48, item 9, $21,415, 120 days; 50, $29,983.25, 224 days; 51, item 2, $2789, item 3, $265, 60 days; 59, item 1, $4700, item 4, $3198, item 5, $151.40, item 6, $288, no time; 62, item 7, $445.50, item 8, $592, 21 days; 81, item 4, $4118.50, item 5, $102.90 and $101.37, item 6, $191 and $189.60, item 8, $934, 90 days; 95, except item 7, $24,310, 180 days; 98, item 2, part, $2562, 100 days; 101, item 9, $11,028 and $11,488, 140 days; 104, $27,735, 120 days; 110, item 2, $3575 and $3698, no time; 115, item 4, $4800, 100 days; 116, item 2, $3825, item 3, $368, 100 days; 117, item 2, $3215, item 3, $220, 120 days; 123, item 1, $5081.30, item 5, $141.06, item 6, $273.06, no time; 124, item 6, $364, no time.

CONTENTS.

PAGE.

The Engineering Societies Building. Illustrated..... 1115
A Beaman & Smith Three-Spindle Milling Machine. Illus.. 1122
Canadian Bounty for Electric Smelting..... 1123
A New All-Steel Pulley. Illustrated..... 1123
A Stationary Centrifugal Gas Washer. Illustrated..... 1124
The Lucas Tube Expander. Illustrated..... 1125
The Gadsden Plant of the Southern Steel Company. Illus. 1126
Hopper Compartment Lake Vessels..... 1129
The Perkins Motor Driven Draw Bench. Illustrated.....1130
The Loew Victor Power Pipe Machine. Illustrated..... 1131
W. N. Kratzer & Co.'s Improvements..... 1131
The Carnegie Institute, Pittsburgh..... 1132
The Cockrane-Bly Metal Sawing Machine. Illustrated.... 1133
War Restrictions on Wireless Telegraphy..... 1133
The Progress of the Canadian Tariff..... 1133
Editorial:
Manganese Ores and Metals..... 1134
Railroad Rates and Capitalization..... 1135
Scarcity of Homes for New England Workmen..... 1135
Correspondence..... 1136
The Conference of Stove Founders and Molders..... 1136
Fluxes and Alloys..... 1137
Personal..... 1140
Obituary..... 1140
The Two New Battleships..... 1141
The Philadelphia Foundrymen's Association..... 1141
Pig Iron Production Decreasing..... 1142
News of the Works:
Iron and Steel..... 1143
General Machinery..... 1143
Power Plant Equipment..... 1143
Foundries..... 1143
Fires..... 1144
Hardware..... 1144
Miscellaneous..... 1144
The Iron and Metal Trades:
A Comparison of Prices..... 1145
Chicago..... 1145
Birmingham..... 1147
Pittsburgh..... 1147
Cleveland..... 1149
Philadelphia..... 1150
Cincinnati..... 1151
The German Iron Market..... 1151
New York..... 1152
Metal Market..... 1153
Iron and Industrial Stocks..... 1154
The Supply Trade at the Foundrymen's Convention..... 1154
The Hill Ore Certificates Analyzed..... 1155
Labor Notes..... 1155
The Machinery and Metal Club Launched..... 1156
The Calumet Steel Company..... 1156
The Machinery Trade:
New York Machinery Market..... 1157
New England Machinery Market..... 1158
Chicago Machinery Market..... 1159
Philadelphia Machinery Market..... 1160
Cincinnati Industrial Notes..... 1160
Government Purchases..... 1161
Hardware:
Condition of Trade..... 1162
Notes on Prices..... 1163
Death of Sayres Hadley..... 1165
The New England Association and the National Convention. Illustrated..... 1165
Hardware Window Display. Illustrated..... 1166
Pacific Federation of Hardware Associations..... 1167
Death of Theodore D. Buhl. Portrait..... 1167
Four Notable Hardwaremen. Portraits..... 1168
Price-Lists, Circulars, &c..... 1169
Requests for Catalogues, &c..... 1169
J. H. Williams & Co.'s Drop Forging Plant. Illus.... 1170
New York Export Houses as Sellers of American Goods 1172
Among the Hardware Trade..... 1173
The Phenix Swinging Half Screen Hanger and Fastener No. 53. Illustrated..... 1174
The King Popgun. Illustrated..... 1174
Delker Bent Panel Automobile Seats. Illustrated.... 1174
Armstrong Window and Door Screens. Illustrated... 1174
Sterling Steel Handle Machinists' Wrenches. Illus.. 1175
The Justryt Shutter Holder. Illustrated..... 1175
Improved Riveting of Egg Beater Gears. Illustrated. 1175
Bailey's Nonheavable Anchor Post. Illustrated..... 1176
The Morss Pitchometer. Illustrated..... 1176
Coldwell Quality Ball Bearing Lawn Mower. Illus... 1176
The Flyer Lever Rotary Washing Machine. Illus.... 1177
The Perfection Expansion Nut. Illustrated..... 1177
Current Hardware Prices..... 1178

HARDWARE

WHILE the gradual and steady growth of our export business in metal products is gratifying and promises well for the future, the fact that foreign fields are cultivated in so partial and intermittent a manner is an evidence of shortsightedness on the part of manufacturers. There are indications, however, that the probable relaxing of the home demand in the more or less near future is making manufacturers turn their attention to export trade, with a view to having an outlet for the large quantities of goods which may not find a market in this country. It is, however, a mistake to suppose that the door to foreign business opens readily.

Export trade appeals to many manufacturers because of its imagined simplicity. Actually it is easy only for such as have comparatively trivial interests. The producer who wants to enlarge his foreign trade, who desires to develop it to the maximum, soon discovers difficulties. Some of the innumerable details are so peculiar and so foreign to his training and methods that he is disposed to neglect, if not to ridicule, them. Every feature in this branch of business must in fact have painstaking and careful attention, notwithstanding the fact that some of the methods and requirements appear to the novice needless, if not absurd. A safe general rule in the cultivation of a profitable export business is minute and incessant exactitude, based upon a knowledge of trade practices and conditions. There are still too many manufacturers doing something abroad who believe they are qualified for such business by a knowledge of the fundamental principles of the trade, and yet the most egregious blunders are constantly being perpetrated by houses that should know better. Only by a careful attention to the instructions which accompany orders and a constant and intelligent study of the whole subject, and especially of the requirements of the different markets into which goods are to be sent, can the manufacturer anticipate success in the effort to extend his relations in foreign fields.

The Hardware business is so complex and ordinarily involves so great a number of small transactions that it requires more than do many lines of trade careful and intelligent attention to a multitude of details. One phase of this matter is alluded to by the manufacturer of a well-known Hardware product, who complains that clerks in a Hardware store are too apt to fail to make note of a customer's inquiry when the article wanted is not in stock. This manufacturer has made repeated tests to ascertain the custom in Hardware stores, taking his own product as the item asked for, and in some instances the clerk has taken no interest in the matter beyond stating that the article was not carried. Possibly he suggested a substitute, which he believed to be as good for the purpose.

Under these circumstances this suggestion naturally failed to meet the views of the inquirer in this special case, and as the article in question was a well known and leading brand, it is not likely that a disinterested customer would often be willing to accept a substitute. Our correspondent makes the point: In a case such as this the clerk should make a memorandum of the inquiry and present it to his employer or to whoever is in charge of the purchasing department of the store. He should tell the customer that he would look into the matter and get it for him if possible. Perhaps it would be wise to suggest first looking at another make of the same article, which is regularly handled. But if this would not meet the customer's wants the effort should be made to accommodate him. Some pains should be taken to make the customer realize that there is a sincere desire to give him what he wants, and even to go out of the way to accommodate him. By this kind of treatment many a fast friend has been made.

The value, however, of making note of such inquiries goes far beyond courtesy to the customer. The merchant may often be governed in his buying by inquiries. Perhaps there may be several customers asking for the same article within a day or two, in which case a supply of the required goods might well be put in stock. The merchant gets a comparison between various makes of the same goods, and may be influenced to drop one line to take on another.

Condition of Trade.

Our reports indicate a very satisfactory movement of merchandise from the jobbers to their retail customers and the spring trade is evidently well under way, seasonable goods naturally having a prominent place. A good many lines continue hard to get, and there is indeed nearly as much complaint on this score as before the slight relaxing of the demand during the past month or two, giving the manufacturers something of an opportunity to catch up with their orders. The advances which have taken place in the market present to manufacturers the temptation to neglect their earlier bookings, and execute first the more remunerative orders of a later date. Reports of the embarrassment caused manufacturers by the scarcity of material and its slow movement over the railroads are frequent, and there is no doubt that a great deal of inconvenience and delay is thus occasioned. There is reason to apprehend that some of the producers of raw material are as a matter of policy withholding its supply with a view to keeping up the price of the manufactured product through the scarcity thus developed. While there is a more conservative spirit noticeable in the trade there is general recognition of the soundness of the prevalent conditions, and an anticipation of good business especially if the crops do not prove a disappointment. The volume of business certainly is large, and prices steady, with scarcely an indication anywhere of weakness. Manufacturers are finding their energies fully occupied in taking care of the business on their books, and are not obliged to make any unusual efforts to secure orders, while merchants generally are buying without misgivings in such quantities as will cover their requirements on the assumption that trade is going to continue in excellent volume and tone.

Chicago.

Following the exceptionally heavy business recorded for the month of March, trade in nearly all Hardware lines for the opening week of April shows vigorous activity. In some directions, it is true, business is not developing as rapidly as heretofore, but taken as a whole there is every reason to believe from present indications

that the current month will not in any respect prove disappointing. As was anticipated the rush of orders for Wire Netting, precipitated by the advance announced to take effect April 1, has overcrowded the already well filled order books, and slower deliveries are the result. Fencing Wire of all kinds is in strong demand, and jobbers are finding it difficult to meet requirements of the trade for prompt shipments. Locally the trade has felt the stimulating effects of an unusual demand, created by the extensive building operations now in progress at Gary, Ind., where the United States Steel Corporation is spending millions of dollars in the construction of new steel mills and furnaces. Besides a large amount of Hardware goods that enter directly into this construction, the building of the new city of Gary that is springing up near the mill site is productive of much additional trade in Builders' Hardware. The demand for the higher grades of Builders' Finishing Hardware, though somewhat short of the phenomenal trade of a year ago, is still of good volume. It is reported that all prices on Padlocks have been withdrawn by manufacturers, and orders are now accepted only subject to prices to be named at time of shipment. No other price changes of moment are noted, and the general tendency to further advance seems to have been checked. In the Heavy Hardware lines no change is apparent. There are indications now observed that, taken in connection with the trend of affairs in other directions, seem to point to a coming relaxation from the strenuous pace of the past few months, and if realized will afford an opportunity for mills and factories, as well as jobbers, to readjust their operations to a more normal basis. The committee composed of and representing the creditors of the Trout Hardware Company, whose financial embarrassment was recently referred to in these columns, has finished its examination of the company's books, but no public report has been made of its findings. An offer of settlement has been made by the company, and it is reported that a number of the principal creditors have signified their willingness to accept settlement on the basis of the terms proposed.

NOTES ON PRICES.

Wire Nails.—Demand is heavy, both in the way of new business and specifications on contract orders The trade is apparently looking for an unusually large consumption of Nails during the present year. Manufacturers have been unable to catch up with deliveries owing to the scarcity of steel and transportation facilities, and now a shortage in the supply of Nail kegs is reported. Prompt shipments are requested for new business, indicating that stocks are light. The market continues very firm. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days.

Carloads, to jobbers	$2.00
Carload lots, to retail merchants	2.05

New York.—Unfavorable weather conditions reduced local demand considerably the present week. Jobbers complain that it is difficult to keep stocks well enough assorted to supply the requirements of customers promptly, owing to delays in receiving Nails from mill. In addition to a shortage of steel and cars, a scarcity of Nail kegs is reported. The market is fairly well maintained notwithstanding the receipt of delayed shipments of Nails, contracted for at much lower than present prices. New York quotations are: To retailers, carloads, on dock, $2.19; less than carloads, on dock, $2.33; small lots at store, $2.30.

Chicago.—It is believed that the demand, always large at this season of the year, and never greater than now, has reached its hight. Relief from present congested conditions is hoped for in the near future, and some betterment in car service and mill shipments is already noticed. Prices remain unchanged, and quotations are as follows: $2.15 in car lots to jobbers and $2.20 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—The leading mills advise us that new demand for Wire Nails, and also specifications on contracts are heavy, and while the mills are using every endeavor to meet the demands of customers for prompt shipments, they are unable to catch up in delayed deliveries, owing to the continued shortage of steel and scarcity in supply of cars. A notable fact is that with new orders, buyers invariably specify prompt shipments, showing conclusively that stocks of Wire Nails held by jobbers are light, and this is also true of the mills. All indications point to an enormous volume of business this year, and output and consumption of Wire Nails in 1907 is expected to eclipse all previous records. The market is very firm, but there are no official announcements of an advance in prices, but this may come at any time, owing to heavy demand, high prices and scarcity of steel. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.00
Carload lots, to retail merchants	2.05

Cut Nails.—Mills have not been able to catch up on orders and shipments are still delayed on account of shortage in the supply of Steel and scarcity of cars. One mill has refused to accept orders for delivery previous to June 1. New business is not as heavy as are specifications on contract orders. Quotations are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, $2.05; less than carloads, to jobbers, $2.10; less than carloads, to retailers, $2.20. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

New York.—Business continues somewhat light in this market, as demand is confined to small lots. Mills have not yet caught up with shipments and some are not accepting orders for deliveries earlier than four to eight weeks. Jobbers' quotations are on the basis of $2.30 for small lots at store.

Chicago.—Jobbers and mill representatives complain of the difficulty in getting stock from the mills, many of which are badly behind with orders. Assortments are broken and in urgent cases express shipments have been resorted to. Both restricted car service and shortage of Steel are held responsible for the scarcity. Quotations are as follows: Iron Cut Nails, car lots, to jobbers, $2.30; to retailers, $2.35; Steel, to jobbers, in car lots, $2.20; to retailers, $2.25.

Pittsburgh.—The Cut Nail mills are making slightly better deliveries but are still somewhat behind on shipments. New orders are only fairly heavy, but buyers are specifying liberally on contracts placed some time ago. There is still a shortage in supply of Steel, and also in cars, which operates against maximum output and shipments. Prices are very firm but unchanged. Quotations are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, $2.05; less than carloads, to jobbers, $2.10; less than carloads, to retailers, $2.20. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

Barb Wire.—Demand on the mills continues heavy, which they are unable to fill as promptly as customers desire. Order books are alluded to as being overcrowded, while scarcity of Steel and cars adds to the difficulty of making prompt shipments. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.15	$2.45
Retailers, carload lots	2.20	2.50
Retailers, less than carload lots	2.30	2.60

Chicago.—The rush for Fencing shows no sign of abatement, but it is expected that when the seeding season begins opportunity will be afforded to clear the present overcrowded order books. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.30; Galvanized, $2.60; to retailers, car lots, Painted, $2.35; Galvanized, $2.65; retailers, less than car lots, Painted, $2.45; Galvanized, $2.75; Staples, Bright, in car lots, $2.25; Galvanized, $2.55; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—Mills are considerably behind in shipments on specifications on contracts placed early in the

year, this condition coming largely from the shortage in supply of Steel and scarcity in cars. It is stated that slight premiums are being paid in some cases where mills will agree to make prompt shipments. Prices are firm, but unchanged, and there is no official information as to an advance in prices, which, however, may be made at any time. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.15	$2.45
Retailers, carload lots	2.20	2.50
Retailers, less than carload lots	2.30	2.60

Smooth Fence Wire.—Conditions in the Smooth Fence Wire market are similar to those of other Wire products. Demand is unusually heavy, and mills are unable to make shipments as promptly as customers desire. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.85
Retailers, carloads	1.90

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base.	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago.—An unusually heavy demand from Fence manufacturers has stimulated the movement of all kinds and sizes of Smooth Wire. Mills are constantly besieged with urgent requests for shipments, which are still coming too slow for customers' requirements. Quotations are as follows: In car lots, to jobbers, $2, f.o.b. Chicago, and to retailers, $2.05.

Pittsburgh.—Demand for Fencing Wire is abnormally heavy and all the mills are much behind in deliveries. Output and shipments are both being retarded, owing to the scarcity in supply of Steel and of cars, it being impossible to get the latter as fast as needed by the mills to move their product. Prices are very firm, but unchanged. We continue to quote f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.85
Retailers, carloads	1.90

The foregoing prices are for base numbers, 6 to 9.

Chisels and Drawing Knives.—A meeting of manufacturers of Chisels and Drawing Knives was held last week and existing prices were reaffirmed. The market, however, may be fairly represented by the quotation of 70 and 10 to 75 per cent. discount, which is close to the figures named as the manufacturers' extreme prices. This is due to the fact that nearly all the larger trade seem to be well supplied with stock or covered with contracts at considerably lower prices than are now current, and are giving their customers the benefit.

Auger Bits.—The market for Auger Bits holds steady to firm, and it is understood that manufacturers are entirely satisfied with the prevailing conditions. A good volume of business is offered, most factories, indeed, being far behind their orders, and few, if any, irregularities in their prices are reported.

Blacksmiths' Vises.—An advance of about 5 per cent. has recently been announced on Blacksmiths' Leg Vises, which, it is declared, have not fully reflected the present high range of prices for raw material. The market may now be represented in a general way by the following discounts:

25 to 100 pounds	50 and 10 per cent.
105 to 135 pounds	50 and 5 per cent.
140 to 200 pounds	50 per cent.

Registers.—While the season for heavy bookings in Registers is past, manufacturers report a steady demand of satisfactory volume for this season of the year. The market has been influenced to a considerable extent by weather conditions, and is said to reflect promptly the increased activity in building operations subsequent to good spring weather. Prices remain unchanged on the basis established by the manufacturers some months ago, and may be represented by a discount to the retail trade of 66 2-3 per cent.

Sandpaper.—The market for Sandpaper has commanded special attention for some time, as competition for orders on the part of those described as outside manufacturers has been exceptionally active, and it is recognized that they have been securing an increasing volume of business. The associated manufacturers have apparently taken the position that they would maintain their schedules regardless of the action of the independents. Report is now current, however, that they have agreed upon a course which will give them a little more leeway and enable them to compete on a more favorable basis as regards prices, and concessions of about 10 per cent. on some brands are reported.

Table Cutlery.—The market for Table Cutlery presents several interesting features. Prices on these goods, especially cheaper goods, are admittedly low, although raw material is on an unusually high level, and is said to be exceedingly hard to get. Some manufacturers report that they are having difficulty in securing sufficient material of certain kinds to keep their plants in operation. Cocobolo, which is the handle material in greatest requirement, is also scarce at this time. All manufacturers agree that prices are unremunerative, but state that owing to the keenness of competition they are unable to secure higher figures, although most if not all of them are doing the largest business in their history and are considerably behind their orders. As is usually the case orders for cheaper goods, such as 1878, are not desired, unless accompanied by a fair proportion of better grades.

Dripping Pans.—As recently stated in these columns the market for Dripping Pans is somewhat lower, as a result of competition, and quotations of from 70 and 10 to 75 per cent. discount are commonly reported by retail merchants. Rumor has it, however, that an effort is being made to improve the situation, which, if successful, would undoubtedly lead to somewhat higher prices, if not to a restoration of the level of a month or two ago.

Machine Screws.—Leading manufacturers have made an advance of 10 per cent. in their prices on cut thread Machine Screws. Following the change these goods would now be quoted to the retail trade at the following general discounts:

Round and flat head, iron brass or bronze	50 %
Fillister head, iron, brass or bronze	40 %

Square and hexagon iron or brass Machine Screw Nuts have had a similar advance, and may be quoted at 50 per cent. discount.

Builders' Hardware.—Notwithstanding the heavy demand for this line of goods, and the fact that many manufacturers are unable to make prompt deliveries, it would appear that there is some irregularity in prices, and that competition for desirable business is increasingly keen. It is even hinted that the schedules of the larger producers who are supposed to be working in harmony are not strictly maintained, while there is the usual cutting by smaller makers on most competitive goods. The situation is becoming decidedly interesting, but the trouble may, perhaps, be satisfactorily adjusted by the larger manufacturers. Developments of the near future are awaited with interest.

Rope.—It is understood that some buyers whose trade demands the best Manila Rope are now ordering Bolt Rope, as the many grades of so-called Manila Rope are unsatisfactory, where limb and life are dependent upon the quality of the goods. It is further learned that some of the Rope offered as Manila is made of Sisal Hemp adulterated with Istle Hemp, an inferior grade of Sisal, and colored to represent Manila Rope. Manufacturers claim that low grade goods are the result of buyers insisting upon Rope at prices which will not admit of the use of high grade material. No doubt the profit is larger to both jobber and merchant in the lower grade goods, and thus the consumer is the sufferer. Pure, long fiber Rope can be obtained from manufacturers if the purchaser is willing to pay a fair profit on the cost of making it. While there is no change in card prices, the market is somewhat affected by the weakening Hemp market and active competition among Rope manufacturers. The following quotations are sometimes shaded ¼ to ½ cent per pound: Pure Manila, 13 to 13½ cents; B quality, 12 to

12½ cents; Pure Sisal, 9¼ cents; No. 2 quality, 7¾ to 8 cents; No. 1 Jute, ¼ in. and up, 9 cents; No. 2 Jute, 8½ cents.

Window Glass.—The tendency of prices for the past month has been downward, attributed chiefly to the action of one manufacturing concern in selling Glass as prices much below those of the National Brokerage Company. The company is reported as not having reduced its prices, but decided that an early shutdown of its plants would have the effect of restoring confidence in the market. It is understood that a capacity of 1,772 hand operated pots has agreed to close down not later than April 20. The estimated reduction in the output, as the result of this early closing of factories, will be about 1,500,000 boxes, as compared with the output of 1905-1906. In view of the unsettled condition of the market, conservative buying may be the wisest policy. Jobbers' quotations from jobbers' list October 1, 1903, are as follows: Greater New York, 90 and 10 per cent. discount on all sizes, single and double strength; outside of Greater New York, 90 and 5 per cent. for single, and 90 and 10 per cent. discount for double strength Glass.

Linseed Oil.—Weakness in the seed market and unfavorable weather has had a depressing effect upon the demand for Oil. Deliveries on contract orders have not been so much in demand, while new business has been light. New York quotations for jobbing lots are as follows, according to quality: City Raw, 42 to 43 cents per gallon; Out of Town Raw, 40 to 41 cents per gallon. Boiled Oil is 1 cent a gallon over Raw.

Spirits Turpentine.—Demand in this market has been confined to small lots, with the market 2 cents higher than last week. New York quotations are as follows, according to quantity: Oil Barrels, 73 to 73½ cents; Machine Made Barrels, 73½ to 74 cents per gallon.

DEATH OF SAYRES HADLEY.

SAYRES HADLEY, late with the Atlas Tack Company, died Thursday evening, April 4, of heart failure, at his home, in New York. He was born in New York in 1837, and as a boy was employed by Jude Field, a manufacturer of Tacks and Nails in this city, with whom he remained until the commencement of the Civil War, when he was among the first to enlist in a New York regiment, serving throughout the war.

On his return from the service, he went with the American Tack Company, Fairhaven, Mass., and was New York manager until the formation of the Atlas Tack Corporation. Mr. Hadley has been connected with the Atlas Tack interests, under the different titles, ever since, by the management of which he has always been highly esteemed. Mr. Hadley was a man of correct life and fine character, conscientious, and thoroughly reliable. He was a member of Pilgrim Church, New York, for over 30 years, and belonged to Alexander Hamilton Post, G. A. R., and Bunting Lodge, F. & A. M. He is survived by a widow.

THE CLINTON WIRE CLOTH COMPANY, 33 Park place, New York, will on or about May 1 remove to a suite of rooms in the fine new Smith, Gray & Co. Building, just erected at the corner of Broadway and Warren street. They will no longer carry a stock of goods in this city, as has been the custom at the present address, the rapidity with which orders can be sent to the factory at Clinton, Mass., and shipped to New York, making this unnecessary. The Chicago office and storerooms of the company will also be removed from 237 East Lake street to 30-32 River street, about May 1.

AT the annual meeting of the stockholders of the Colt's Patent Fire Arms Mfg. Company, Hartford, Conn., these officers were elected: President, Lewis C. Grover; first vice-president, William C. Skinner; second vice-president, Frank C. Nichols; treasurer, Frank A. Schirmer; secretary, Arthur L. Ulrich; assistant treasurer, William B. Williams; directors, Lewis C. Grover, William C. Skinner, Frank A. Schirmer, J. F. A. Clark and Charles A. Morse.

THE NEW ENGLAND ASSOCIATION AND THE NATIONAL CONVENTION.

AS already noted in these columns the 1907 convention of the National Retail Hardware Association will be held in Boston during the week beginning June 17. The annual meeting of the New England Hardware Dealers' Association will be held during the same week. The officers and members of the New England Association are making very elaborate preparations for the entertainment and comfort of the visitors, and have appointed a large number of committees who are working with energy and intelligence for the success of the gathering.

In connection with the convention a large Hardware exhibition will be held, in which manufacturers and jobbers will participate. Nearly all of the display space has already been engaged. The Press Committee has in charge an attractive and interesting volume in the shape of a guide book of Boston, with its many historical features, which will be pretty thoroughly circulated in the States covered by the membership in the National Association.

NATIONAL
RETAIL HARDWARE ASSOCIATION
NEW ENGLAND HARDWARE DEALERS ASSOCIATION
ANNUAL CONVENTION - BOSTON, MASS. JUNE 18-21, 1907
ALL HARDWAREMEN ARE INVITED

Convention Paster Which Is Being Freely Used.

A Rally Call from President Bush.

E. M. Bush, Evansville, Ind., president of the National Association, has issued a rally call on behalf of the convention, from which we make the following extracts:

Every individual member of the various State associations will be welcomed, and I urge that every one who can will avail himself of this opportunity, not only to attend the convention himself, but to bring with him his wife and daughters, and with them visit the historic places that abound in and about Boston.

In this neighborhood more Hardware is manufactured than in any other part of the country, and a visit to these factories will alone be worth the time and expense of the trip. And in addition to this, to the warm welcome that awaits you and to the benefits of the convention will be the great pleasure of a visit to these hallowed spots, dear to the heart of every true American, in which Boston is rich and which she has preserved for the edification of her countrymen, winning thereby their lasting gratitude and her own just glory.

Let "On to Boston" be our cry, and a rousing convention our great aim from now until June 18, when, I earnestly hope, we shall gather in record breaking numbers at the Hub of the Universe.

AT a special meeting of the stockholders of Landers, Frary & Clark, New Britain, Conn., held on the 26th ult., the recommendation of the Board of Directors to increase the capital stock of the corporation from $1,000,000 to $1,250,000 was approved. Last year the company increased its capital from $750,000 to $1,000,000. The company is engaged in extensive enlargements, which have been noted from time to time in *The Iron Age*. Last year $100,000 was spent in new construction. The money received from the sale of the new stock will be devoted to other important developments of the business.

THE IOWA RETAIL HARDWARE ASSOCIATION has issued the official "Gazette," which contains a full report of the proceedings of the ninth annual convention of the association, held at Des Moines, February 19-22. It is a well printed volume and presents a good deal of matter besides the convention report, which will be valued by the Hardwaremen of the State. A. R. Sale is the efficient secretary of the association, with headquarters at Mason City.

Hardware Window Display.

FIRST ARTICLE.

IN no respect is the increasing enterprise of the Hardware trade more distinctly indicated than in the attention given to window dressing. The exploiting of show windows on an elaborate scale began in the stores appealing for the trade of casual shoppers. In this class, of course, women predominate, and the goods which women purchase are obviously exceptionally well calculated to make handsome displays.

Originally the Hardwareman had no show window, and such windows as he did have were rather used for catch-alls and odds and ends of stock than for attracting outside attention. Within recent years Hardwaremen are coming more and more to realize that they must appeal for the trade of casual shoppers and of women, and this perhaps as much as anything else has forwarded the movement toward artistic window dressing of the modern sort.

Importance of this Form of Advertising.

A comparison of results is sufficient to show that intelligent window dressing is the most practical and economical method of advertising. In buying newspaper space a merchant recognizes not only the limitations of the subscription list, but the still more important fact that a large proportion of the paper's subscribers will not read it thoroughly, and of these a still smaller proportion will notice his ad.

Comparative Circulation.

The circulation, to use an advertising term, of a show window on a prominent business street is undoubtedly greater than that of any other local advertising medium. By circulation is meant the number of people whose attention it may and probably will command. Used in connection with advertisements in local papers the value of the show window is greatly increased. One form of advertising may be regarded as a complement of the other, and there is always a likelihood that attention caught but not held by the printed ad. will be renewed and riveted by the repeated suggestion which the window affords. For example, Mrs. Brown may notice in the morning paper a special advertisement of Carpet Sweepers, but think little more about it until in passing the window of the advertiser where Sweepers are exhibited she will recall the impression previously made. These two appeals together may be sufficient to attract her into the store and lead to the purchase of the Sweeper. Thus it is always an advantage when a merchant can use newspaper space in connection with his window to emphasize the goods he is featuring.

Newspapers Assist.

Any merchant can readily satisfy himself as to the extent to which sales may be influenced by window displays by making a show of some article or line for which there is not much call. The resulting increase in sales will surely surprise him and convince him of the fact that this method of advertising is in every way successful, and will amply justify its trifling expense. If a window display will stimulate the sale of uncommon, out of the way goods, how much more will it do with a seasonable article in large demand, like Skates in winter, Screens in spring and Preserving Kettles in the fall.

Demonstrating Results.

This series of articles has been prepared in recognition of the increased attention which the Hardware trade is giving to this subject not only in cities, but also in towns and rural communities. It is hoped to present some valuable ideas and a good many practical suggestions with illustrations which will be of interest to our readers, and which they can actually use in their business.

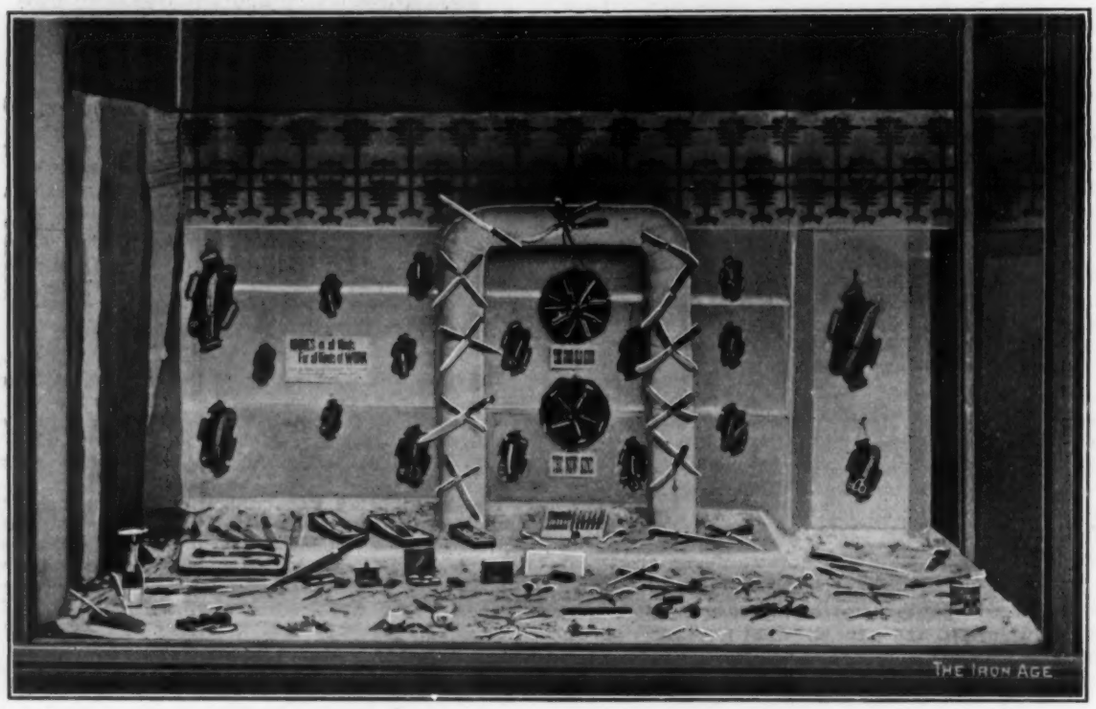


Fig. 1.—Window Devoted to Cutlery Only.

Concentrated Displays.

Many expert window dressers lay down the principle that concentration is all important, that a window ought to have unity, being devoted to one individual line or allied group. They say that a window having one definite subject or referring to one particular article is sure to make sales, whereas a display made up of many heterogeneous articles of stock is unlikly to attract attention, as it does not convey any distinct idea. While it is undoubtedly true that concentrated windows are effective and should be used from time to time, it would appear to the practical Hardwareman that this attitude is too sweeping, and that a window may often be made attractive by the use of a variety of articles intelligently and artistically displayed.

Cutlery Window.

The accompanying illustration, Fig. 1, affords an excellent example of what we have termed a concentrated display relating to Cutlery. Elaborate as it appears, the win-

Minimum Expense.

dow may be said to represent the minimum of expense, as about all the outlay required was 35 cents for crêpe paper. The metal plates or holders on the back wall are furnished gratis by several Cutlery houses. The arch, which will be observed as the central figure of the window, was made of ordinary Stove Pipe covered with white crêpe paper, and is a striking example of a substantial and even imposing effect secured by homely means. The use of signs is also illustrated by those referring to the Razors shown. Ordinary Razors are referred to as follows:

THE GOOD OLD KIND.

A corresponding sign calls attention to the Safety Razors as follows:

THE NEW KIND.

Another sign reads:

KNIVES OF ALL KINDS
FOR ALL KINDS OF WORK.

(To be continued.)

DEATH OF THEODORE D. BUHL.

THEODORE D. BUHL of Detroit, Mich., died of apoplexy on Sunday afternoon, 7th inst., in Thirty-fourth street, near the Waldorf-Astoria Hotel, New York City, which he had just left, apparently in his usual good health, for a walk. Mr. Buhl came to New York the day previous, accompanied by his wife. He had been to Boston, where he had purchased a large steam yacht, the Anona, leaving orders to have it refitted preparatory to sending to Detroit for a cruise on the Great Lakes.

Theodore D. Buhl was one of the most active and successful of Detroit's business men. He was born in that city August 20, 1844. His father, Christian H. Buhl, was a very successful business man originally and for many years in the fur business, and at his decease left a large estate, of which Theodore Buhl inherited a considerable share. Mr. Buhl was educated in Detroit and in the East and gained his entire business experience in the Hardware firm which his father and Charles Ducharme had founded in 1855. The death of Mr. Ducharme made a place for Theodore and his brother, Frank H. Buhl, in the firm, and ultimately Theodore Buhl became president of the company. The business was increasingly successful and Mr. Buhl extended his interests, becoming, as time passed, associated with many other large enterprises. At his death he was president of Buhl, Sons & Co., Buhl Malleable Company, Buhl Stamping Company and National Can Company. He was also president of the great drug house of Parke, Davis & Co., and vice-president of the old Detroit National Bank, Detroit Trust Company and the Detroit Copper & Brass Rolling Mills, besides being identified with many other large interests. While still a young man Theodore Buhl married Elizabeth Walker, daughter of the late Hiram Walker.

Mr. Buhl was regarded as one of the ablest business men in Detroit. His intimate association in so many large business enterprises left him little time for recreation, and a favorite means of relaxation was found, it is said, in managing a farm. It is expected that in the enterprises of which Mr. Buhl was president, he will be succeeded by the present vice-presidents, in which event Willis E. Buhl will become president of Buhl, Sons & Co.; Alexander McPherson, president of the Buhl Malleable Company; D. M. Ireland, president of the National Can Company; Charles H. Jacobs, president of the Buhl Stamping Company and David C. Whitney, president of Parke, Davis & Co.

Mr. Buhl had a wide circle of friends, and because of his sterling integrity and unpretentiousness, coupled with most excellent judgment, was highly esteemed by all who knew him. He was a member of the Detroit Club, Country Club, Board of Commerce, New York Yacht Club and other social organizations. He was also

THEODORE D. BUHL.

a member of the Fourth Street Presbyterian Church. He is survived by his widow, one brother, Frank H. Buhl of Sharon, Pa., and three sons, Willis E., Arthur H. and Lawrence D. Buhl.

PACIFIC FEDERATION OF HARDWARE ASSOCIATIONS.

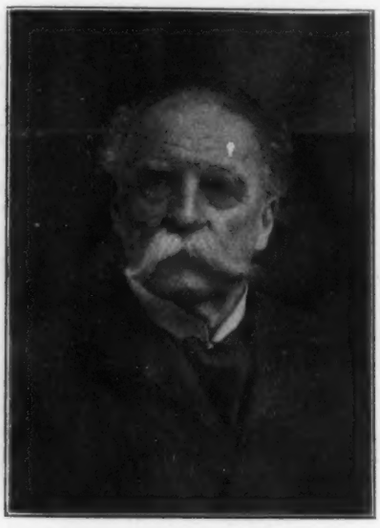
THE meeting which was held in Portland, Ore., in March for the purpose of forming a federation of the Hardware and Implement Associations in Pacific Coast territory was not as well attended as had been hoped for, owing to the floods in that section of the country, which delayed for several days some of those who came, while others gave up the trip altogether. A temporary organization was, however, effected, and while it is not anticipated that much will be accomplished this year, it is believed that a very successful and powerful federation will eventually result.

Following are the temporary officers and directors: President, John Smith, Walla Walla, Wash.; First vice-president, R. L. Spiker, Lewiston, Idaho; second vice-president, C. M. Brown, Hollister, Cal.; secretary-treasurer, E. W. Evenson, Spokane, Wash. Directors: E. B. Judd, Great Falls, Mont.; C. F. Carpenter, Helena, Mont.; S. W. Dee, Boise, Idaho; C. S. Graybill, Nampa, Idaho; H. E. Humphrey, Whittier, Cal.; Oscar Schulze, Dixon, Cal.; W. J. Clarke, Pendleton, Ore.; E. L. Scott, Oakesdale, Wash.; E. E. Lucas, Davenport, Wash.; F. A. Ernst, Seattle, Wash. The permanent headquarters have not been decided upon as yet, but, inasmuch as Mr. Evenson is temporarily in charge of the work, Spokane, Wash., will be the temporary headquarters. Later on Portland will probably be selected, in view of its central location. With the exception of Mr. Evenson, all the officers and directors are retail merchants, men of prominence and influence in their respective localities and actively engaged in the work of their various State associations. The next meeting will be held at Portland some time in February, 1908.

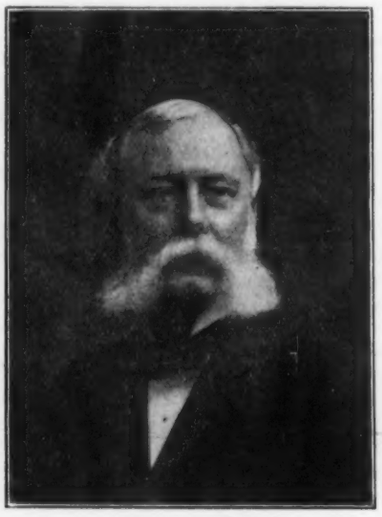
S. NORVELL, president of the Norvell-Shapleigh Hardware Company, St. Louis, Mo., has been elected a member of the City Council. Mr. Norvell had the distinction of leading the winning ticket, his majority being in excess of 6000.

FOUR NOTABLE HARDWAREMEN.

THE accompanying portraits represent the personality of a remarkable group of Hardwaremen, which has propably in certain respects no parallel in Hardware circles in this country. There are Hardware houses in the United States, both of a commercial and manufacturing character, the business of which was established much before that of what is now Sargent & Co., but, so far as we are informed, there is no business organization in the Hardware field which has had for its guidance four men in the highest executive positions who have for so long a period been without change continuously in charge of a great New York house, whose sales are well up in seven figures annually, while a much greater volume of business naturally goes direct to the factory in New Haven, Conn.

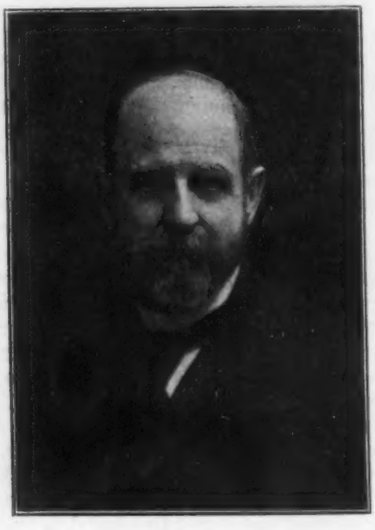


GEORGE H. SARGENT.



WILLIAM J. LADD.

Not only have George H. Sargent, Thomas J. Atkins, William J. Ladd and George Munson been identified with the house of Sargent & Co. almost from its foundation, but they have averaged 50 years of successful and notable service, each in his own sphere, and in entire harmony for the betterment of the business. For even a longer period Joseph B. Sargent has been in charge of the manufacturing portion of the business at the works, for many years located at New Haven, Conn., where over 4000 persons are employed.



THOMAS J. ATKINS.

GEORGE MUNSON.

George H. Sargent, after his graduation at Harvard, studied a year in the Harvard Law School to qualify himself for the bar, in accordance with a determination to become a lawyer, but he was persuaded by his brother, J. B. Sargent, to link their fortunes together in following a mercantile career. The business of this house begins with the venture of the older brother, now 85 years old, who came to New York in 1850 and established a small Hardware store at 24 Cliff street, Russell & Erwin occupying the street and second floor and he having the third floor, direction to which was indicated by a small metal sign on the door.

A start was made with the selling of Hand Cards on his own account, and he was likewise the representative in New York of the Peck & Walter Mfg. Company, which at New Britain, Conn., manufactured House Furnishing, Builders', Cabinet and Trunk Materials, Undertakers' and Saddlers' Hardware, Stair Rods, Candlesticks, Curry Combs, Horse Cards, Blind Staples, &c. In 1857 the Sargent brothers purchased the manufacturing business of Peck & Walker, which practically established the real date of the beginning of the business as now conducted.

The career of George H. Sargent as a business man began in January, 1853, Thomas J. Atkins being employed February 4, 1856, having been brought to New York from a lawyer's office in Brooklyn by John H. Graham, who was himself a clerk in the house, and who later founded what is now John H. Graham & Co. Mr. Atkins' duties have always been along the line of selling goods, and for the greater part of the time he has been manager of sales.

The youngest of the group, William J. Ladd, was employed by George H. Sargent, September 19, 1856. Young Ladd had graduated from a New York public school, and

had successfully passed an examination for entrance to the free academy, now the College of the City of New York, but his extreme youth, being then only 13 years of age, proved a hindrance, the academy authorities considering him ineligible because of his lack of years. As Mr. Ladd's father, who manufactured trunks, had been overtaken by adversity, the boy was anxious to obtain employment, and in the course of his search happened along while Mr. Sargent was marking a case on the sidewalk. He was asked if he could do such work, Mr. Sargent carrying on a conversation with him, which finally resulted in his hiring the boy. Among Mr. Ladd's earlier duties was the checking of invoices and kindred work, but being exceedingly ambitious, he sought and improved every chance to sell goods during the day, realizing the broader opportunities in that important field, and caught up with his regular occupation as he best could, and often in overtime. The first catalogues were compiled by J. B. Sargent, the earliest of which, issued in 1855, it is interesting to note, weighed but 4 oz., containing Builders' and Undertakers' Hardware, and Cotton, Wool, and other Cards. Having an aptitude for such work, however, Mr. Ladd quickly acquired a proficiency and skill, so that since 1869 he has had sole charge of that department, the Sargent catalogue having long been regarded as a standard in catalogue making. The requirements of that feature of the business now necessitate the services of several assistants. The fact that the last catalogue weighs 15 lb. is some indication of the growth of the business since the ¼-lb. catalogue of 1855. Mr. Ladd is also the author of Ladd's Discount Book, which has an established reputation in the trade.

The last of the "Big Four" to connect himself with the house is George Munson, who went to Sargent & Co., from Russell & Erwin, in 1861. He has always been identified with the buying of goods. He is regarded by Mr. Sargent, his chief, as a shrewd, accomplished and popular buyer of Hardware of unquestioned integrity.

These veterans, dating in business activity respectively from 1853, 1856, 1856, and 1861, have thus averaged over 50 years each in constant charge of their various positions, while their ages average 70 years, the eldest, Mr. Sargent, being 78, and the youngest, Mr. Ladd, 64 years old.

PRICE-LISTS, CIRCULARS, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

THE F. J. MEYERS MFG. COMPANY, Hamilton, Ohio: Illustrated circular showing Flower Vases, Lawn Settees and Chairs.

CHANDLER & FARQUHAR COMPANY, 34-38 Federal street, Boston, Mass.: Catalogue 1907, special No. 1, containing lists of Screws, Bolts, Nuts, Reamers, Files, Taps, Drill Rods, Music Wire, &c.

MEAD CYCLE COMPANY, 23-27 No. Clinton street, Chicago, Ill.: Advance sheet of 1907 model Iroquois Bicycles, illustrating various styles of women's and men's Wheels, and Hedgethorn Puncture Proof Self-Healing Tires.

MASSACHUSETTS SAW WORKS, Chicopee, Mass.: Illustrated pamphlets devoted to Victor brand Hack Saw Frames and Blades, Coping Saws, Butcher Saw Blades, Bookbinder's Saw Frames and Saws, Knurled Cup Point Nail Sets, Knurled Center Punches, &c.

MANHATTAN ELECTRICAL SUPPLY COMPANY, 17 Park Place, New York: Catalogue No. 22, relating to Telegraph Instruments, Magneto Signal Bells, Telephones, Push Buttons, Burglar Alarms, Annunciators, Electric Alarm Clocks, Gongs and Bells, Home Medical Apparatus, Batteries, Sparkers, Flash Lights, Electric Fans, &c.

W. EDDY PLOW COMPANY, Greenwich, N. Y.: Catalogues Nos. 27 and 28, illustrating Harrows, Weeders, Cultivators, Land, Lawn and Garden Rollers; Garden Wheelbarrows, Dirt Scrapers, Circular Saw Machines; Rye Threshers, Lawn Mowers, Lawn Chairs, Farmers' Feed Cookers, Feed Cutters, Corn Shellers, Plows, &c.

KEUFFEL & ESSER COMPANY, 127 Fulton street, New York: Circulars devoted to Folding Rules, Sperry's Pocket Calculators and Automatic Photograph Print Hangers.

S. STERNAU & Co., 237 Broadway, New York: Folder illustrating the Sternau Coffee Machine, Coffee Machine Sets and Koholia, a prepared liquid for burning.

THE CONSOLIDATED MFG. COMPANY, Toledo, Ohio: Catalogues relating to Snell's and Yale Bicycles; Yale-California Motor Cycles and Hussey Handle Bar.

IOWA MUZZLE COMPANY, Carroll, Iowa: Circulars referring to Swender's Patent Weaners and Dog Muzzles.

W. C. HELLER & Co., Montpelier, Ohio: "Simple System," an illustrated booklet with price-lists, diagrams, &c., referring to Steel Hardware Shelf Boxes, Cases, &c.

PHENIX MFG. COMPANY, Milwaukee, Wis.: Illustrated pamphlet devoted to Storm Sash and Window Screen Hangers and Fasteners.

WHEELING CORRUGATING COMPANY, Wheeling, W. Va., New York office, 47 Cliff street: Illustrated catalogue No. 210, of Sheet Metals, Conductor Pipe, &c., Galvanized Ware, Steel Roofing, Metal Shingles, &c.

AMERICAN RAILWAY SUPPLY COMPANY, 24 Park place, New York: Pamphlet entitled "Time Checks and Their Uses." It is principally devoted to a description of the method of using time checks employed by a prominent manufacturer. The company will be pleased to quote prices and submit samples to those interested.

ANCHOR FENCE & MFG. COMPANY, Cleveland, Ohio: Catalogue No. 15, illustrating an elaborate line of Ornamental Iron, Steel and Wire Work for buildings, offices, stables, &c; also illustrated booklet referring to Anchor Farm and Railroad Fence, Gates, &c., and Fence Builders' Tools and Supplies.

W. W. LAWRENCE & Co., Pittsburgh, Pa.: Booklets referring respectively to R. L. O. Preservative Coating, Re-Sist Enamel Paint, Yellow Seal White Lead and Zinc, Lawrence Perfect Metallic Paint and Brushes.

TRADE ITEMS.

CHARLES S. LAWRENCE, who has for some time been connected with W. B. Fox & Brother, Hardware purchasing agents, New York, has resigned his position and leaves this week for Chicago, where he will open an office for himself in the same line of business. Speaking of his plans, Mr. Lawrence says that he has long believed that an agency in Chicago would be of service to many jobbers in different parts of the country. He also states that in starting his enterprise, he does not conflict with the New York purchasing agencies, and can, if they so desire, work in harmony with them, although he expects to have direct connection with the trade. He refers to the well known advantages of Chicago as a shipping point, and suggests that there are many items that do not weigh enough for direct shipment which can be assembled there and re-shipped West, South and East. Mr. Lawrence's experience in the purchasing business should enable him to serve his clients successfully, and with the care and attention to details requisite to securing best results.

THE annual meeting of the Reading Hardware Company, Reading, Pa., resulted in the election of William Griscom, Bryn Mawr, president; A. A. Gery, Reading, vice-president; J. Milton Miller, secretary; Matthew Harbster, John G. Mohn, William Griscom, A. A. Gery, W. H. Mohn, S. Y. Reigner and J. Milton Miller, directors. Mr. Griscom has been interested in the company for 50 years or so.

THE PACIFIC HARDWARE & STEEL COMPANY, San Francisco, Cal., will remove its New York office on April 20 from 90 West Broadway to rooms 604 and 605 Postal Telegraph Building, 253 Broadway.

GEORGE E. PICKERING, for many years employed by the Walworth Mfg. Company, Boston, Mass., has been appointed resident agent of the company for the Pacific Slope, with headquarters at San Francisco.

J. H. Williams & Co.'s. Drop Forging Plant.

FOURTH ARTICLE.

The third article of the series describing J. H. Williams & Co.'s drop forging plant, at Brooklyn, N. Y., which appeared in our last issue, contained references to the executive force and some of the departments, including those for finishing and die making and the packing and shipping rooms.

Stock Shipping Tickets or Order Blanks.

When a customer's order is received it is immediately transcribed in the company's own nomenclature to obviate errors in filling it, Fig. 16. The transcription is made in duplicate on a thin white sheet, 6¾ x 8½ in., which is filed in the office. The thicker duplicate in buff color, Fig. 17, has a back as in Fig. 18, being sent to the shipping room for execution. These tickets, or order blanks, are used for goods regularly kept on hand. All shipping instructions, it will be seen, are noted on the ticket, so that no questions need be asked by either stock clerks or

No. 7243 SHIPMENTS 12/3/06 – 12/10/06

Date, Dec. 2, 1906. N

Completed. 12/31/06

Name, Empire State Hardware Co.,

Address, 1734 Blake St.,
Denver, Colo.

Their Order 4723 *Ship via* ED c/o CRI&P

Pkgs. *Mark* M & T Dept.

	Quantity	Goods	Sizes or Numbers
	50	Finished Wrenches	#10
	100	Semi-fin'd Wrs. ea.	#27 30 65
	150	Unfinished Wrs. ea.	#3260 329A With pin hdles.
	48	"C" Clamps ea.	#12 16
	50	Lathe Dogs ea.	#4 11
	12	Vulcan Wrs. ea.	#11 12 14 Flat Chain
	100	Vulcan Hooks ea.	#7 10 12
	50	Eye Bolt Blanks ea.	#5 7 25
	12	Vulcan Pipe Vises	#2

Fig. 16.—Stock Shipping Ticket, Original.

shipping clerks. Having been prepared for shipment in the stockroom, the goods are sent to the shipping room for packing and forwarding. As soon as the shipment is completed the ticket is returned to the bill clerks, in the main office, who make the invoice from it. The back of the duplicate, or buff ticket, is ruled, Fig. 18, for the purpose of taking weights of goods in order to check the accuracy of the counting where quantities are large. The total weight being obtained, a weight of 25, 50 or 100 pieces is also taken to find the average weight of one forging, and having found this the total weight is divided by it. If errors in count have occurred they will thus appear by comparing the number found in this way with the number originally counted by hand. This method is regarded as a safeguard for both the manufacturer and customer, the system having demonstrated its value frequently in the adjustment of claims made in good faith. In one instance recalled, the company was so confident of its position that a further search developed the fact that the transportation company had not delivered all of the shipment.

The method of checking the count, after selecting a given number of small pieces, is to place them on a narrow metal tray about 10 in. long, which is moved by special apparatus parallel with the beam of a platform scale, so that an accurate weight of a small number is ascertainable. There are also large scales for weighing truckloads of material out of doors, as it passes into the works inclosure. These tickets are ultimately kept in an indexed box, lettered A to Z, with separating cards to divide each group.

This now traces an order up to the point of actually shipping the goods. From the data noted by the stock

No. 7243 STOCK SHIPPING TICKET

Date, Dec. 2, 1906. N

Name, Empire State Hardware Co.,

Address, 1734 Blake St.,
Denver, Colo.

Their Order 4723 *Ship via:* ED c/o CRI&P

Pkgs *Mark* M & T Dept.

	Quantity	Goods	Sizes or Numbers
	50	Finished Wrenches	#10
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	48	"C" Clamps ea.	#12 16
	50	Lathe Dogs ea.	#4 11
	12	Vulcan Wrs. ea.	#11 12 14 Flat Chain
	100	Vulcan Hooks ea.	#7 10 12
	50	Eye Bolt Blanks ea.	#5 7 25
	12	Vulcan Pipe Vises	#2.

Checked by *Completed*

Fig. 17.—Stock Shipping Ticket, Duplicate.

clerks and packers on the shipping ticket the shipping clerk prepares the shipping receipt on the company's special form, 8½ x 10 in., Fig. 19, upon a typewriter, especially designed for the purpose.

Register of Shipments.

Another form in use in the shipping office is the register of shipments, Fig. 20, 10 x 14 in. in size. The headings for the double columns are for the drivers' names,

Date		Cor. #9	Cor. 11	Cor. 27	E.R. 5			Est.	Total Wt.			Partial Wt.	
Dec	31	258						252	668	41	627	10	25#
			100					100	583	39	544	10	54#
				700				701	2440	21	219	10	3#
					1100			1103	4448	40	408	50	18#

Fig. 18.—Back of Duplicate Stock Shipping Ticket.

and, as the goods in shipping order are turned over to the respective cartmen, they are listed on this sheet by order numbers only in the wide columns, the narrow columns being used for checking purposes. At the close of the day this sheet is returned to the accounting department, where the invoice clerks check up the invoices they have made according to the order numbers with the list on the register of shipments. If any discrepancy is shown it is immediately investigated. This sheet is also used to check the return by the drivers of freight or express receipts. After the matter has passed the invoice clerks, the sales book is checked with the thin copy of the shipping ticket, Fig. 16, previously referred to as being filed in the office. This is a final check, and should partial shipment have been made on an order it is noted on the sheet as a partial shipment, and when completed

UNIFORM BILL OF LADING—ORIGINAL

RECEIVED subject to the classification in effect on the date of the receipt by the Carrier of the property described in this Original Bill of Lading at Brooklyn, N. Y., Dec. 3, 1906. From J. H. WILLIAMS & CO. 150 Hamilton Ave.

Shippers No.

By Erie Despatch c/o Chicago, Rock Island & Pac. Railroad Co. Agents No.

The property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned and destined as indicated below, which said Company agrees to carry to its usual place of delivery at said destination, if on its road, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property, over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the conditions whether printed or written, herein contained SEE CONDITIONS ON BACK HEREOF, and which are agreed to by the shipper and accepted for himself and his assigns as just and reasonable.

"The conditions of the regular Bill of Lading of the Steamship Co. covering this shipment are hereby made a portion of this contract. AND THE CARRIER SHALL NOT BE LIABLE TO, AND ONLY AS TO, THE SERVICE RENDERED BY SAID STEAMSHIP CO., and are binding as SO SAID SERVICE the same as if expressed herein."

If it is mutually agreed that the rate of Freight from above named station, to ... is to be in cents per 100 pounds.

H—Three 1st	If 1st Class	If 2d Class	If 3d Class	If 4th Class	If 5th Class	If 6th Class

Consigned to Empire State Hardware Co.,

Mail Address—Not for the purpose of Delivery 1734 Blake St.

Destination Denver, State of Colorado. County of

Notify

At State of County of

Route Car Initial Car No.

No. Packages	Description of Articles and Special Marks	Weight (Subj. to Correction)	Class or Rate	Check Column
Two	(2) Boxes Iron Wrenches	1274		
One	(1) Box Pipe Wrenches	503		
One	(1) " Vises	185		
Three	(3) Bbls. Rough Iron Forgings	2548		

If shipper wishes to prepay the charges, write or stamp here. "To be Prepaid"

Received $ to apply in prepayment of the charges on the property described hereon

Agent or Cashier

Per (The signatory here acknowledges only the amount prepaid.)

Charges advanced.

$

M & T Dept.

No 4038

Agent

Fig. 19.—Company's Own Shipping Receipt Form.

it is so recorded. Having been completed the sheet is then filed in a separate place, and only those orders which are unfilled are kept open in the office file. The thin, or original, sheets are filed in lots of 500, and no 500 is put away until it is complete. From time to time there is a comparison made between the orders that are in the stock clerk's possession and the register file of the office, so as to prevent the possibility of the loss of tickets.

Invoice, Sales Book and Voucher Manifold Forms.

The invoicing of goods from the stock shipping tickets is done on specially prepared forms, printed three on a sheet, of which Fig. 21 is one, the entire sheet being 10¾ x 16¾ in. in size, with two ⅜-in. holes at back and two rows of perforations by which to tear off the invoice as made. This set of forms is in duplicate (yellow), triplicate (white) and quadruplicate (light blue). The original, which is also white, goes to the customer, the yellow copy, not perforated, becomes the sales book on the loose leaf principle, the white copy or triplicate is used as a voucher for the accounting department, and the light blue or quadruplicate is kept as a statistical voucher. Provision is also made for additional invoices, which are sometimes required. Postings are made from the vouchers for the accounting department, and they are also used for a variety of purposes incidental to the business. The fourth manifold copy enables the managers to analyze and keep close track of goods sold. For example, by the use of this record a customer's purchases for any given period can be easily grouped, the figures often suggesting special attention from a salesman or by correspondence. If it is apparent that a falling off in purchases exists the matter is investigated to find out why. Opportunity for increased sales is often suggested when the figures are grouped by periods in this way. Having this record available, the bookkeepers are not embarrassed by any occasional absence of the sales book from their jurisdiction.

Stock Cards and Cabinet.

In the stock clerk's office there is a useful drawer cabinet, Fig. 22, which contains inventory stock cards, Fig. 23, on strong but thin manila cardboard, 3½ x 6½ in. The stock clerk after properly heading the card,

J. H. WILLIAMS & CO.,
150 HAMILTON AVENUE.

BROOKLYN, NEW YORK, Dec 3, 1906

Marvin		Mayer		Smith						Express
3743	2432	3761	4726	2439	4312					4721
2760	2437	3785	9241	2761						9432
4157	9601	3896	8537							3127
2983	2783	3990								
3472	8490									
2987										

Fig. 20.—Register of Shipments.

Our Order P2133
Your Order 47481
Pkgs. Boxes
Bbls. 1 Kegs
Weight 227
Via Cent. R. R.
TERMS CASH

J. H. WILLIAMS & CO.
DROP-FORGINGS,
150 HAMILTON AVE.
Brooklyn-New York, Jan. 9, 1907.

SOLD TO John Doe & Co.,
Doeville, N. J.

2000	Small Bolt Forgings @ 10	200.00
	Doe St. Station.	
	47481	

Fig. 21.—Invoice of Merchandise for Customer.

both sides of which are used, records in the left hand column the exact number of articles of any kind, finished or partially finished, of which his department is the custodian. The next column on the right receives the number of articles withdrawn at any time. When the three pairs of columns are filled the back, which is similarly printed, is filled up. The sum of the right hand column deducted from the amounts received from the shops during the year represents the stock on hand in the bin. These tickets are kept for a year, at the

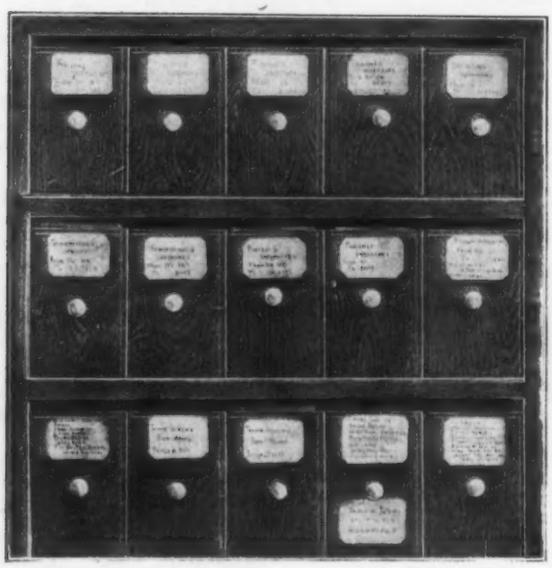


Fig. 22.—Cabinet for Holding Inventory Stock Cards.

end of which the number sold and the number on hand are noted in red ink at the bottom and returned to the main office for inventory purposes. If at any time throughout the year it becomes desirable to take an inventory it can be readily obtained in this way. Experience has proven the worth of this system and occasional tests have revealed but slight errors. The boxes or drawers in which the cards are kept are suitably labeled for identification. At the beginning of a new year the differ-

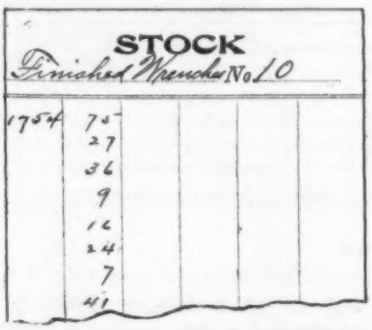


Fig. 23.—One Side of Inventory Stock Card.

ence between the two columns is calculated and the amount representing the stock on hand is entered on a fresh card and the process repeated.

(To be continued.)

The Farmers' Hardware Company, Clay City, Ind., has been incorporated with a capital stock of $12,000 by Jacob Gruber, Lewis Schafer and Grael Schafer.

Smith Hardware Company, Crowley, La., has sold its business to McAyeal Hardware Company.

The name of Morris Hardware Company, Morris, I. T., has been changed to Pugh Hardware Company. There has been no change in the organization or personnel of the concern.

NEW YORK EXPORT HOUSES AS SELLERS OF AMERICAN GOODS.

THE selling organization of an export commission house naturally varies with the different firms. Some of them have absolutely nothing in this respect, apart from a more or less extensive campaign of correspondence. A few of them occasionally send out a traveling salesman, in which case it is not uncommon to ask contributions toward his expenses from manufacturers. Some export houses have their own foreign establishments located at central points of certain special territories. But the foreign branch houses falling under the last classification are not always all that the claims made for them by the home houses in New York would lead one to expect. Some of the New York export houses maintain properly so-called branches in charge of their own men—that is, men trained in the home office and familiar with American goods and methods, and with the policy of their own chiefs.

Foreign Branches?

But another class of commission house boasts foreign branch establishments that are not entitled to such a designation. The letterhead of one such house bears the addresses of 12 "branches" in various foreign capitals. Yet it is within the writer's personal knowledge that not one of the 12 is in any proper sense of the word a "branch"—in not one of them is there a direct representative of the New York house—all of them are simply the addresses of local merchants or agents with whom the New York house has arranged to receive any stray letters that may arrive in their name, and, in some cases but not in all, to display a small sign supplied by the New York house. But few of them have any genuine interest in the business of the New York house, and some of them have none at all. Another New York house, usually ranked as one of the largest, is still printing on its letterheads the addresses of two branches, which once had an actual existence, but were given up several years ago. One might attribute this to an oversupply of old writing paper, were it not for the fact that within a few months the actual verbal claim was made by the head of this house to an American manufacturer that one of these defunct branches was still in existence and doing business. These facts are mentioned as illustrative of the truth that here, as in so many cases, "all is not gold that glitters."

Exclusive Selling Agencies.

Another lesson is to be drawn in this same connection, namely, that the selling organization of commission houses is much stronger in certain territories than in others, and that therefore before any of the "exclusive selling agencies" are granted that the commission houses are very fond of seeking on every pretext, a rather careful investigation should be made as to whether the house in question is able to give the best or even an adequate representation in the territory in question. It need not be hinted that the mere word of the commission house itself is not conclusive in this regard. The question of a worldwide agency is disposed of by the mere consideration of the facts just stated. There is no commission house in the United States that is in position to take up the "sole export agency" of any line of goods whatsoever and give it adequate representation throughout the whole world. Even if a commission house has legitimate "branches" or other selling organization in special territories, it may, even in such territory, cut but a very insignificant figure in the local race for orders.

Diversity in Orders to Commission Houses.

Or, again, since the business of a commission house is general in character, devoted to Hardware, hams, furniture, leather, rosin and what not, it will almost always be found that certain of its branch houses or departments are strong in one line of merchandise and weak in another. A branch in China, for example, may do a very large business in cotton goods, but scarcely anything in Hardware, while one in Japan will have important engineering connections and another in Australia sell almost

exclusively Hardware. In these same territories, however, other American houses may be operating whose facilities are precisely the opposite of those of the first house. Hence, the necessity of selecting intelligently the most desirable commission house connection in each special territory, when the question is broached of "sole agency" or "special inducements."

Lack of Specific Knowledge.

Very much the same elements should enter into the account when consideration is asked of a project by a commission house to send abroad a traveling salesman. The manufacturer may please himself as to making a contribution toward the expenses involved, but he will be wise if he is guided by the recollection that the salesman is not only going to take Hardware, but also cotton goods, boots and shoes, and more than probably a dozen different and totally dissimilar lines of goods, and that his attention will be chiefly occupied with those goods that he personally is best acquainted with or that sell easiest. Then, too, the salesman's time will be all too limited to allow of any adequate attention to all of the various lines which he is attempting to represent, and not improbably some of them will get no attention at all.

Devious Ways.

Probably no form of commerce has been and is so full of moonshine as the export commission business. Misrepresentation is too common at home and abroad. The commission houses are in the habit of demanding extra price concessions and special "private commissions" which are on no account to be divulged to their clients, while at the same time they gain and hold their foreign connections with the claim that they allow their clients every advantage in price reduction which they are able to command, because of their preeminent position in the home market as enormous wholesale buyers, which individual buyers could never command, all in return for the small commission charged. Their position towards the manufacturer is that they cannot afford to devote time to his special line on the small commission that they get from their clients, although it has frequently happened that the commission house has used special discounts obtained from manufacturers to cut the prices charged by their competitors. The commission house pleads work done or to be done in behalf of a manufacturer's line as justifying a special price, but not a few cases are constantly coming to light where the manufacturer first makes the acquaintance of a hitherto unknown commission house because of the fact that the latter has received and secretly has on hand an order specifying the manufacturer's goods, for which he does not dare substitute—orders prompted not by the effort of the commission house, but by the manufacturer himself or because competing merchants have discovered and introduced the line.

House Papers.

Sundry commission house schemes, such as catalogue or price current advertising, are generally looked at askance nowadays, even though sometimes worthy enough, as in times past they certainly have been important sources of revenue to their originators if to no one else. In these cases again, the ultimate result can only be judged by the facts in each case, which require more than a cursory examination, and more than the commission house's unsupported assertions.

Fallacy of Arguments for Exclusive Selling Agencies

As an "exclusive" selling agent a commission house is but rarely desirable. This does not deny the fact that there exist instances where a branch establishment of a commission house affords the very best possible opportunity of cultivating the trade of a city or a territory. Such instances, for example, would include some territories that are almost impossible to work satisfactorily except through local agents, and if a branch of an American house exists and is properly managed and is disposed to the special work required by particular lines, then a connection with such branch is emphatically to be recommended. However, it is not to be denied that instances are very few indeed where commission houses, either through branch establishments or in any other fashion, have taken up a staple "competition" line, as are most lines of goods, and made a noteworthy success of it—creating or developing a market for the manufacturer.

Some Exceptions.

In those cases where a commission house has actually introduced a line and in a large way, it will always be found that the line in question was a novelty or a monopoly for which a hungry market was waiting, or with which the commission house happened to be first in the field, or one that because unknown afforded large profits. As a rule, it may be asserted that the commission house salesman, either from the home office or from a branch, has his time entirely too fully taken up with the thousand and one articles which he already knows or which his market knows, to afford the time and work that new goods always entail. The goods already introduced, those that sell easiest, occupy the attention of the commission house man, and usually to the exclusion of all others.

The Manufacturer's Alternative.

There is but one really effective way for a manufacturer to develop foreign markets. That is, to do it himself, even if he prefers that resulting orders reach him through the hands of commission houses. And there is but one sensible way in which a manufacturer can develop foreign markets, in which indeed he can judge of comparative commission house value to him, and that is by visiting foreign fields himself or in the person of a thoroughly competent representative. It may be added, however, that better judgment should be used in the selection of foreign representatives than has often been the case.

AMONG THE HARDWARE TRADE.

Haas Bros., Weiser, Idaho, have been succeeded in the Hardware, Stove, Implement, Paint and Sporting Goods business by Herman Haas Hardware & Implement Company.

E. E. Morr has sold to the company his interest in the Union Hardware & Supply Company, Ashland, Ohio. J. R. Heichel has taken stock in the firm, which will continue under the same name as heretofore.

Frank W. McNutt, formerly with F. H. Lawson Company, Cincinnati, Ohio, has bought the Hardware, Tinning, Stove, Paint and Cement business of Jacob Fink, Mt. Healthy, Ohio.

Arkadelphia Hardware Company, Arkadelphia, Ark., has been incorporated with a capital of $15,000 to conduct a retail business, including Stoves, Implements, Paints, Sporting Goods and Vehicles.

J. A. Linquist has purchased the store of W. B. Cox & Son in Ellsmore, Kan., and will carry Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints and Oils.

Hermiston Hardware & Implement Company, has been incorporated in Hermiston, Ore., to do a retail business in Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Sporting Goods, Crockery, Seeds, &c.

Hullum Hardware Company, Sayre, Okla., has been incorporated with a capital of $10,000 to deal in Shelf and Heavy Hardware, Stoves, Implements and Sporting Goods.

The Hardware, Stove, Implement and Paint business of Green & Green, Alva, Okla., has been sold to A. T. Edwards.

The Hardware firm of Garner & Weinhold, Craig, Neb., which recently suffered a fire loss, has been dissolved.

The Phenix Swinging Half Screen Hanger and Fastener No. 53.

The accompanying cuts represent fixtures for a swinging screen covering the lower half of a window, offered by Phenix Mfg. Company, Milwaukee, Wis. An outside view of the device is given in Fig. 1, indicating how the screen is hung by the fixtures, which are illustrated more in detail in Fig. 3. In Fig. 2 the inside appearance

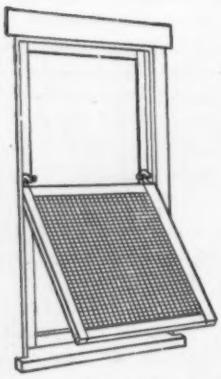


Fig. 1.—The Phenix Swinging Half Screen.

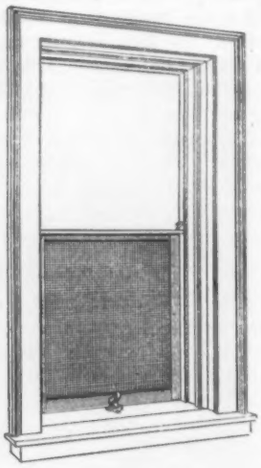


Fig. 2.—Inside View of Swinging Half Screen.

of the screen is shown secured by the catch illustrated in Fig. 4. Among the special features of the hanger and fastener the following are mentioned: That it does away with all objectionable disadvantages of sliding half screens; that there are no pieces which might split off from the grooved sides of a screen; that there is an absence of springs and slide strips which might interfere with storm windows, and no parts to loosen or replace when making the change from screen to storm sash; that the hanging screens do not stick, cannot be raised,

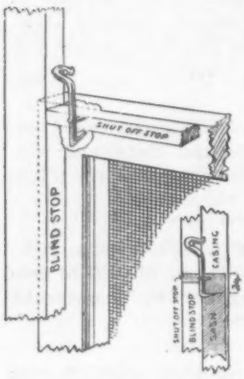


Fig. 3.—Inside View of Half Swinging Screen with Shut-Off Stop.

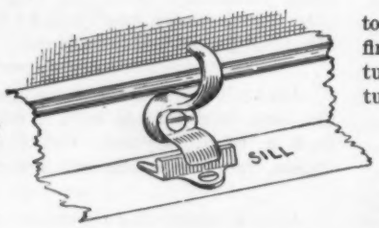
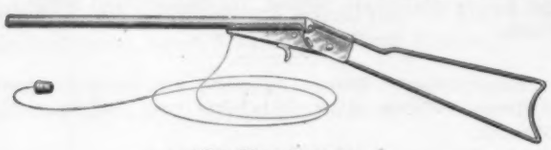


Fig. 4.—Catch Fastening for Half Screen, Inside.

pushed or blown off from pivot by accident, are flyproof, and that the screen is stronger and will outlast a sliding screen.

The King Popgun.

The Markham Air Rifle Company, Plymouth, Mich., has added to its line of air rifles the King popgun here



The King Popgun.

shown. It is made entirely of steel, nickel plated and polished, and is declared to be very strong to withstand the hard knocks of youngsters. It is 15 in. long. The gun shoots a cork attached to cord, as shown in the cut, and the maker states that, although it does no damage, it makes lots of noise. Three, 6 and 12 dozen are packed in a case.

Delker Bent Panel Automobile Seats.

The George Delker Company, Henderson, Ky., manufacturer of vehicles, is now offering a line of buggies with bent panel automobile seats, one of which is shown in Fig. 1. The feature of this seat is its construction, which

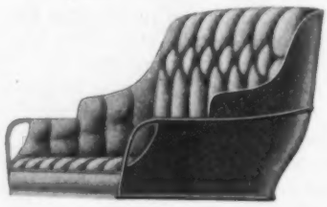


Fig. 1.—Delker Bent Panel Auto Seat.

is declared to be unique in that it consists of only two pieces, an upper and lower panel, as shown in Fig. 2. The company states that to bend the lower panel with cone corner, that is, with flaring back and sides, it is necessary

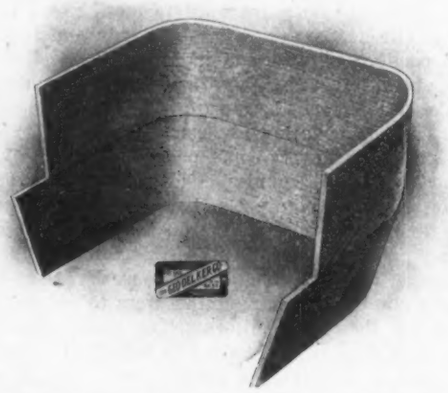


Fig. 2.—Construction of Bent Panel Seat.

to use the finest panel stock three times the width of the finished bending, as illustrated. The company manufactures many styles of these seats, which can be substituted in most of its styles of buggies at varying prices.

Armstrong Window and Door Screens.

The Standard Stamping Company, Marysville, Ohio, is manufacturing the Armstrong Art Panel Screens, some views of which are presented herewith. The frames are of metal about 1 in. in width, leaving practically the whole window opening for ventilation, and ½ in. in thickness, allowing them to be placed on the narrowest of

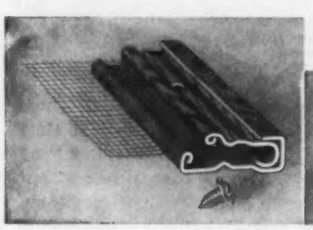


Fig. 1.—Frame Open.

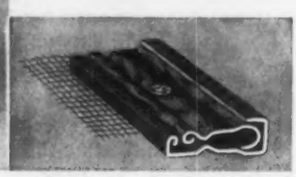


Fig. 2.—Frame Closed.

Armstrong Screen Frames.

window stops. The manufacturer states that outside shutters do not in any way interfere with the screens. Being made to order only, they may be expected to fit

exactly and may be had in the style best suited to requirements, whether it be sliding, passing or stationary. They are preferably made, however, to travel in metal guides, screening only one-half of the window at a time. To remove screens from the guides it is only necessary

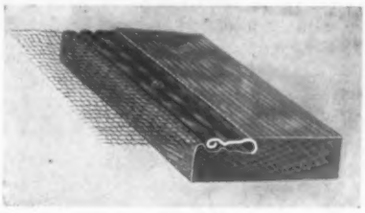


Fig. 3.—Frame and Movable Part of Screen Door.

to exert a slight pressure to one side. It is claimed that screen fabric can be renewed with the greatest ease, since the sides of the frames are made in two parts, one working within the other and of such shape that as the parts are drawn together with the screws the screen cloth is stretched perfectly tight, and when in a closed position is firmly held. It is declared that the whole operation can be accomplished with no other tool than a screw driver, and that the parts fit together so nicely that the frame has the appearance of a single piece.

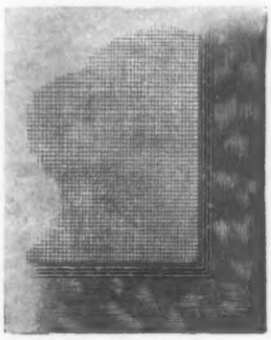
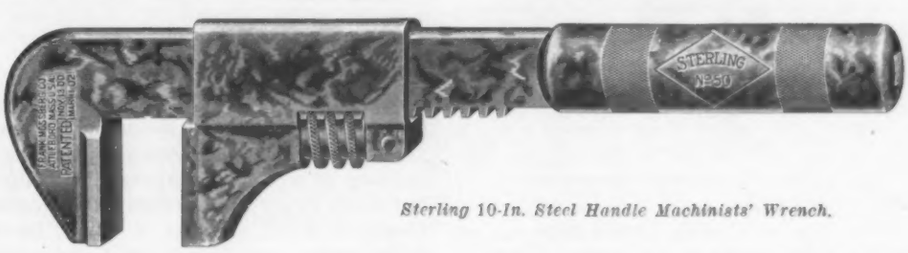


Fig. 4.—Appearance of Finished Door.

Fig. 1 shows the frame open for the insertion or removal of the cloth, and Fig. 2 the frame in closed position with the cloth in place. The company is also applying the same idea to screen doors, Fig. 3, offering wood frames or stiles grooved the same shape as the fixed member in the screen frame, so that by using the same movable metal part for stretching and clamping the fabric similar results are accomplished. A portion of the finished door with the screen cloth in place is shown in Fig. 4.

Sterling Steel Handle Machinists' Wrenches.

The accompanying illustration represents a new 10-in. machinist's wrench with steel handle added to the Sterling line made by Frank Mossberg Company, Attleboro,



Sterling 10-In. Steel Handle Machinists' Wrench.

Mass. The thickness of the jaws is ½ in. and the depth of jaws 1⅝ in. An 8-in. wrench has also been added to the line which has jaws ⅜ in. thick and 1⅛ in. deep. The wrenches are made in both nickel plated and mottled finishes, and are designed for machinists, plumbers and fitters. They are especially recommended for automobiles, boats, &c., where a strong handy wrench is needed. A 10-in. wrench is also offered without handle.

The Justryt Shutter Holder.

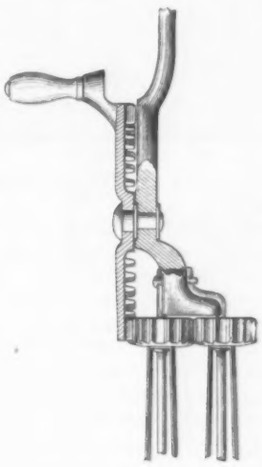
F. P. Smith & Co., Sharon Hill, Pa., is offering the device shown in the accompanying cut for holding shutters partly open. In putting the holder on the shutter the screw eye, which is attached to the holder, is screwed

The Justryt Shutter Holder.

into one shutter about an inch from the edge, and a screw eye, with an oblong ring which accompanies the holder, is screwed into the opposite shutter at the same level. The holder is slightly bent or curved to suit the radius of the shutter, so that the loops fit in the oblong eye. The shutters may thus be bowed at varied distances apart to exclude the sun and yet permit ventilation.

Improved Riveting of Egg Beater Gears.

The accompanying sectional cut of egg beater gears illustrates the improved method adopted by Holt-Lyon Company, Tarrytown, N. Y., for riveting the gears to the handle. A recess is made in the handle of sufficient size



Improved Riveting of Egg Beater Gears.

to hold a steel washer. A shouldered rivet that goes through the gear wheel fits closely in the washer and passes through the handle. The rivet can now be headed down solidly without tightening onto the gear, and will remain, it is explained, in this condition for years without becoming loose. The rivet stands perfectly true without any vibration. This manner of riveting has been adopted to insure the gear wheel being held down to its proper place, and thus prevent the slipping of the cogs. The company claims that beaters riveted in this manner can be guaranteed to last five years for ordinary family use.

The firm of Cooper & Day has been succeeded by the Cooper Hardware & Implement Company, Vernon Center, Minn. Included in this transfer are the Hardware and Implement stores operated by Cooper & Day at Amboy and Vernon Center, Minn.

Bailey's Nonheavable Anchor Post.

The accompanying cuts represent a nonheavable post, offered by Percy T. Bailey, Melville Station, Newport, R. I. The post is T-shaped in cross section, consisting of a head with a central web or flange. The prongs, or anchors, are so mounted that when driven down they curve outward and are imbedded in the ground on all

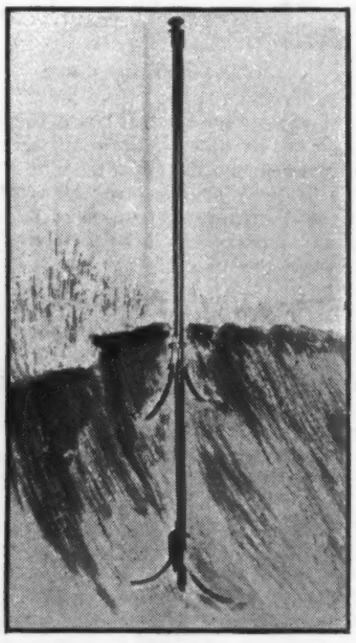


Fig. 1.—Bailey's Nonheavable Anchor Post.

sides of the post, thus holding the post firmly in an upright position when subjected to severe lateral strain. Each post is supplied with an upper and lower set of anchoring prongs, the two sets being at right angles to each other. A plate is secured to the lower end of the post against the outer end of the flange by means of two upper and lower bolts, which pass through the head of the post. Resting against opposite faces of the flange, between the head and this plate, are two anchoring prongs, which consist of narrow plates of metal, pointed at the lower ends. The prongs pass under the upper bolts, but the points curve out over the lower bolts, so

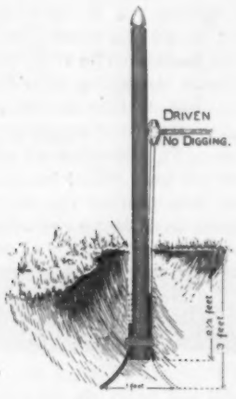
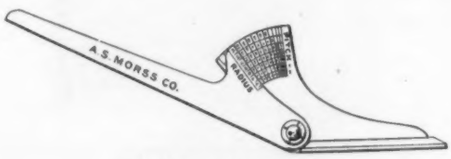


Fig. 2.—Driving Lower Anchors of Bailey Post.

that when driven downward they spread outward, as shown in Fig. 2. Near the top of the ground a pair of straps are bolted to the post. These are bent to form sockets, in which the upper pair of prongs are seated. The straps are framed with offsets, causing the points of the prongs to curve outward when driven down. The post is driven by using a maul, first making a hole of the required depth with an ordinary crowbar or post hole auger. The anchors are then driven in place, the lower ones first, with the aid of a rod and maul.

The Morss Pitchometer.

A. S. Morss Company, Boston, Mass., is offering the instrument here shown for determining the pitch of a propeller. The company states that by following directions it is possible to read the pitch with this instrument at a glance, and in addition it may be found whether or not the pitch is uniform from hub to tip and whether

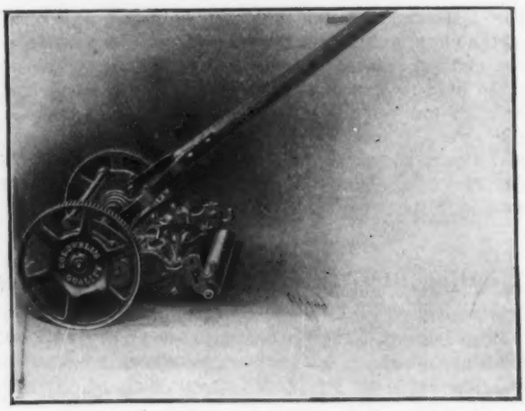


The Morss Pitchometer.

all the blades have the same pitch. The instrument is made of tool steel nickel plated. In using it the propeller is laid on a table or other flat surface with its axis perpendicular. The pitchometer is then placed against the edge of the blade perpendicular to its axis and about two-thirds of the length of the blade to the center of the shaft. This distance must be an even number of inches, as the radii for which the table is calculated are in even inches. After the arm of the instrument is adjusted to lie flat on the blade the pitch may be read in the proper column.

Coldwell Quality Ball Bearing Lawn Mower.

The accompanying illustration represents the Quality ball bearing mower, which is an addition to the well known line made by Coldwell Lawn Mower Company, Newburgh, N. Y. The special feature of the construction of this mower to which attention is called by the company is that the wheels, as well as the revolving cutter, are run in ball bearings. These ball bearings in the wheels being in the place where they are most effective, are said to add greatly to the lightness of draft, owing to the fact that there is friction between the revolving



Coldwell Quality Ball Bearing Lawn Mower.

cutter blades and the bottom knife which tends to form a break and prevent free revolution of the cutter. This mower is also provided with a new bottom knife, built in the form of a piece of channel iron, which it is said will last much longer than ordinary knives, since if one edge should wear out or break it can be taken out and reversed and a new edge brought into position. Another feature of this machine, to which attention is called, is the fact that by removing one drive wheel the entire mower can be taken apart. The wheels are high, 10¼ in. in diameter, while the diameter of the revolving cutter is 6 in. The gearing consists of an external rear drive on both sides. There are five blades in the revolving cutter, and sizes listed run from 14 to 20 in. The finish is gold with green trimmings.

The Flyer Lever Rotary Washing Machine.

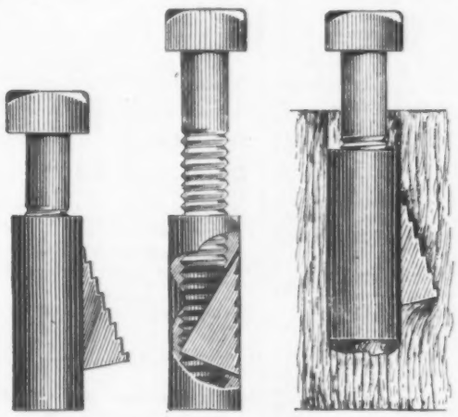
H. F. Brammer Mfg. Company, Davenport, Iowa, is offering the washing machine shown in the accompanying illustration. The lever is used as a means of starting the mechanism, which imparts a reciprocating motion to the dasher in the tub. To the lever is connected a large

The Flyer Lever Rotary Washing Machine.

balance or flywheel, which, after the lever has been set in motion, rotates at a rapid speed which can be very materially increased without fatigue to the operator. The company claims that the mechanism is of the simplest type of compound gearing, having the least possible number of parts, all being properly proportioned and strongly made. The flywheel, while on the same shaft to which the dasher is attached, revolves independently of the dasher, and this combination is said to have made it possible to reduce the number of parts to a minimum, lessening friction. The speed and consequent momentum of the flywheel naturally tends to carry the mechanism over its dead center and prevents slowing up as a result of any sudden load being thrown on the mechanism by any bunching of the clothing which may happen. Thus, by means of the flywheel the operator is relieved of any exertion to keep the machine in perfect operation. A comparatively slow and easy forward and backward motion imparted to the handle by the operator will transmit to the dasher an amply sufficient number of forward and backward movements to bring about quick and satisfactory results, the dasher making a three-quarter turn with each stroke.

The Perfection Expansion Nut.

Ames Sword Company, Chicopee, Mass., is placing on the market the expansion nut shown herewith. It is referred to as simple in construction, easy to apply and effecting a great saving in time and labor. There are no collars or sleeves necessary; the nut is positive in action and it can be used several times in the same opening when necessary. No special directions are required, except to drill the hole to receive the nut, insert the bolt or screw and screw it up. It is explained that the nut is adapted to all uses where expansion bolts or nuts are required; that it works equally well in iron, brick or



The Perfection Expansion Nut

stone and is especially adapted to wood, as it crushes into the fiber, having no tendency to split or crack. The point is made that it makes a perfect joint bolt, as it is unnecessary to bore the second hole and plug it up after receiving the nut.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	℔ gal
Linseed, City, raw	42 @43
City, Boiled	43 @44
State and Western, raw	40 @41
Raw Calcutta, in bbls.	@70
Lard, Extra Prime, Winter	77 @78
Extra No. 1	56 @58
No. 1	50 @54
Cotton-seed, Crude, f.o.b. mills	34 @35
Summer Yellow, Prime	46½@47
Summer White	50½@51
Yellow Winter	50½@51
Sperm, Crude	59 @60
Natural Winter	72 @73
Bleached Winter	75 @76
Bleached Winter, Extra	@..
Tallow, Prime	61 @62
Whale, Crude	35 @36
Natural Winter	46 @47
Bleached Winter	48 @49
Extra Bleached Winter	50 @51
Menhaden, Brown, Strained	32 @33
Light Strained	32 @33
Northern	@..
Southern	@..
Cocoanut, Ceylon	℔ lb 9⅝@ 9¾
Cochin	℔ lb 10⅝@10¾
Cod, Domestic, Prime	37 @38
Newfoundland	40 @42
Red, Elaine	47 @50
Saponified	℔ lb 6⅞@ 7
Olive, Italian, bbls., Yellow	83 @90
Neatsfoot, Prime	56 @57
Palm, Logos	℔ lb 7 @ 7⅛

Mineral Oils—

Black, 29 gravity, 25@30 cold test	℔ gal, 11½@12
29 gravity, 15 cold test	12½@13½
Summer	11½@12
Cylinder, light filtered	19 @20
Dark, filtered	16½@17½
Paraffine, 903-907 gravity	14 @14½
903 gravity	13 @13½
883 gravity	10¾@11¼
Red	13 @14½

Miscellaneous—

Barytes:	
White, Foreign	℔ ton $18.50@20.50
Amer. floated	℔ ton 19.00@20.00
Off color	℔ ton 13.00@16.50
Chalk, in bulk	℔ ton 3.00@ 3.25
In bbls.	℔ 100 lb .. @ .35
China Clay, Imported	℔ ton 11.00@17.50
Cobalt, Oxide	℔ 100 lb 2.50@ 2.60
Whiting, Commercial	℔ 100 lb .43@ .52
Gilders	℔ 100 lb .55@ .65
Ex. Gilders	℔ 100 lb .60@ .65

Putty, Commercial—℔ 100 lb

In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.45
In 1 lb to 5 lb cans	2.65 @2.95
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—℔ gal.

In Oil bbls.	73 @73½
In machine bbls.	73½@74

Glue—

	℔ lb
Cabinet	12 @15
Common Bone	7½@ 9
Extra White	18 @24
Foot Stock, White	12 @14
Foot Stock, Brown	9 @11
German Hide	12 @18
French	10 @40
Irish	13 @16
Low Grade	10 @12
Medium White	14 @17

Gum Shellac—

	℔ lb
Bleached, Commercial	46 @48
Bone, Dried	56 @..
Button	10 @50
Diamond I	59 @60
Fine Orange	52 @57
A. C. Garnet	46 @47
Kala Button	35 @36
D. C.	63 @64
Octagon B	56 @57
T. N.	48 @49
V. S. O.	60 @61

Colors in Oil—

	℔ lb
Black, Lampblack	12 @14
Blue, Chinese	36 @46
Blue, Prussian	32 @36
Blue, Ultramarine	13 @16
Brown, Vandyke	11 @14
Green, Chrome	12 @16
Green, Paris	@24
Sienna, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @14

White Lead, Zinc, &c.—

	℔ lb
Lead, English white, in Oil	9⅝@10
Lead, American White:	
Lots of 500 lb or over, in Oil	@ 7½
Lots less than 500 lb, in Oil	@ 8
Lead, White, in oil, 25 lb tin pails, add to keg price	@ ½
Lead, White, in oil, 12½ lb tin pails, add to keg price	@ 1
Lead, White, in oil, 1 to 5 lb asst'd tins, add to keg price	@ 1½

Lead, American. Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.

	℔ lb
Zinc, American, dry	5⅝@ 5½
Zinc, French:	
Antwerp, Red Seal, dry	8¾
Antwerp, Green Seal, dry	10¾
Paris, Red Seal, dry	9¼
Paris, Green Seal, dry	11

Zinc, V. M. French, in Poppy Oil:
Green Seal:
Lots of 1 ton and over 13¼@13⅝
Lots of less than 1 ton 13¾@13⅞
Zinc, V. M. French, in Poppy Oil:
Red Seal:
Lots of 1 ton and over 11⅞@12⅜
Lots of less than 1 ton 12¼@12⅝
Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	℔ lb
Black, Carbon	@4@10
Black Drop, American	4 @ 6
Black Drop, English	5 @15
Black, Ivory	16 @20
Lamp, Com.	4 @ 6
Blue, Celestial	4 @ 6
Blue, Chinese	31 @33
Blue, Prussian	29 @32
Blue, Ultramarine	14½@15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.10@3.25
Green, Chrome, ordinary	3½@ 7
Green, Chrome, pure	17 @25
Lead, Red, bbls., ½ bbls., kegs	@ 7¾
Litharge, bbls., ½ bls., kegs	@ 7¾
Ocher, American	℔ ton $8.50@16.00
American Golden	2½@ 3½
French	1¾@ 2
Foreign Golden	3 @ 4
Orange Mineral, English	10 @12
French	10¾@12
German	8½@10
American	8¾@ 9
Red, Indian, English	4½@ 6
American	3 @ 3¼
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer.	℔ 100 lb $0.50@1.25
English	100 ℔ $1.15@1.75
Sienna, Italian, Burnt and Powdered	3 @ 9¾
Italian, Raw, Powdered	3 @ 7
American, Raw	1¼@ 2
American Burnt and Pow'd.	1¼@ 2
Talc, French	℔ ton $18.00@25.00
American	℔ ton 15.00@25.00
Terra Alba, French	℔ 100 lb .90@ 1.00
English	℔ 100 lb .80@ 1.00
American	℔ 100 lb, No. 1, .75@ .80
American	℔ 100 lb, No. 2, .60@ .65
Umber, T'key, Bnt. & Pow.	2¼@ 3½
Turkey, Raw and Powdered	2¼@ 3½
Burnt, American	1½@ 2
Raw, American	1½@ 2
Yellow Chrome	13 @15
Vermilion, American Lead	7 @25
Quicksilver, bulk	65 @..
Quicksilver, bags	@68
English, Imported	65 @70
Chinese	$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1906, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, ₱ doz. $3.00.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ₱ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ₱ doz. pairs .....$2.00@$3.00

Anvils—American—

Eagle Anvils.....₱ lb @8½¢
Hay-Budden, Wrought.....9½@9¾¢
Trenton .....₱ lb 9½@9¾¢

Imported—

Peter Wright & Sons, ₱ lb, 84 to 349 lb, 11¢; 350 to 600 lb, 11½¢.

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....33⅓%

Augers and Bits—

Com. Double Spur..70&5@70&10%
Jennings' Pats., reg. finish....60&5@60&10%
Black Lip or Blued...65@65&5%
Boring Mach. Augers.....70%
Car Bits, 12-in. twist.....40&10%
Ford's Auger and Car Bits.....40&5%
Ft. Washington Auger Co., Conard's 35%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list..25%
No. 30, R. Jennings' list.....40&7½%
Russell Jennings .....25&10&2½%
L'Hommedieu Car Bits.....45%
Mayhew's Countersink Bits.....45%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills—See *Drills, Twist.*

Expansive Bits—

Clark's small, $18; large, $26....50&10%
Clark's Pattern, No. 1, ₱ doz. $26; No. 2, $18.....60&10&10%
Ford's, Clark's Pattern.....60%
C. E. Jennings & Co., Steer's Pat..25%
Lavigne Pat., small size, $18.00; large size, $36.00.....60&10&10%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$5.50@6.00
Ames .....25&10%
Universal 20%
Wood's Universal.....25%

Ship Augers and Bits—

Ship Augers.....40&10%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' .....33⅓&7½%
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdled, Shldered...gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. $1@3¼¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality.....$4.75@5.00
Second Quality.....$4.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—See *Grease, Axle*

Axles—*Iron or Steel*

Concord, Loose Collar..4½@5 ¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose..3½@4 ¢
No. 1¼ Com., New Style3¾@4¼¢
No. 2 Solid Collar.....3¾@4¼¢
Half Patent:
Nos. 7, 8, 11 and 12....70@75%
Nos. 13 to 14.....70@75%
Nos. 15 to 18.....75@75&5%
Nos. 19 to 22.....75@75&5%

Boxes, Axle—

Common and Concord, not turned lb., 4½@5¢
Common and Concord, turned. lb., 5½@6¢
Half Patent.....lb., 9½@10¢

Bait—Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances—Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....50@50&10%
Straight Balances.....40@40&10%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb.... per lb., 2¾@3¢

Towel

No. 10 Ideal, Nickel Plate..₱ gro. $3.50

Beams, Scale—

Scale Beams.....40%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ₱ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ₱ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned.....₱ doz. $1.50
Western W. G. Co.:
No. 1 Electric.....₱ gro. $7.80
No. 2 Buffalo.....₱ gro. $9.00
No. 3 Perfection Dust.....₱ gro. $8.00

Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 360, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover.....$6.00
Western, W. G. Co., ₱ gro., Buffalo, No. 2, $8.00; Perfection, No. 3, $9.00.
Wonder (R M. Co.)..₱ gro. net, $6.25

Bellows—

Blacksmith, Standard List..
Split Leather.....65%
Grain Leather.....60%

Hand—

Inch..	*6*	*7*	*8*	*9*	*10*
Doz..	*$5.50*	*6.15*	*6.60*	*7.15*	*7.70*

Molders—

Inch..	*9*	*10*	*11*	*12*	*14*
Doz..	*$8.00*	*9.00*	*10.50*	*12.50*	*14.50*

Net Prices.

Bells—Cow—

Ordinary Goods...75&5@75&10&5%
High grade.....70&10@75%
Jersey .....75&10%
Texas Star.....50%

Door—

Abbe's Gong.....40@40&10%
Barton Gong.....50%
Home R. & E. Mfg. Co.'s.....55&10%
Trip Gong.....50@50&10%
Yankee Gong.....40&10@50%

Hand—

Polished, Brass.....50@50&10%
White Metal.....50@50&5%
Nickel Plated.....40&10@50%
Swiss .....50&10@50&10&5%
Cone's Globe Hand Bells.....33⅓@35%
Silver Chime.....25@30%

Miscellaneous—

Farm Bells.....lb., 2¼@2½¢
Church and School.....60%
Table Call Bells.....50@50&10%

Belting—Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard 70%
Light Standard.....70&5%
Cut Leather Lacing.....45%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—

Agricultural (Low Grade).... 75@75&5%
Common Standard....70@70&10%
Standard .....60&5@60&10%
Extra .....60@60&5%
High Grade.....50&5@50&10%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.
Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list: Chain, Parts, Spokes.....50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden.....75%
Harts St. Tackle Blocks.....50@50&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 50%
Stowell's Novelty, Mal. Iron.....50%
Stowell's Loading.....50&10%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....40%
Embossed 50%

Boards, Wash—See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread): ⅜ × 6 and smaller.70&12½@—%
Larger and Longer.60&2½@—%
Phila. Eagle $3.00 list May 21, '99 40%
Bolt Ends.....65@65&5%
Machine, ⅜ x 4 and smaller.. 70&12½@—%
Machine, larger and longer.. 60&7½@—%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz.	*$0.30*	*.35*	*.45*	*.60*	*.80*

Cast Iron Spring Foot, Jap'd:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.20*	*1.50*	*2.25*

Cast Iron Chain, Flat, Japanned:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.00*	*1.40*	*1.65*

Cast Iron Flat Shutter, Jap'd., Brass Knobs:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.75*	*.95*	*1.25*

Wrought Barrel Japd..80@80&10%
Barrel Bronzed.....60&10%
Spring .....70&10@70&10&10%
Shutter .....50&5@50&10&5%
Square Neck.....75@75&10%
Square .....70&10&10%
Ives' Patent Door.....50%

Plow and Stove—

Plow .....65&10@—%
Stove .....85@85&10%

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84....80%
Eagle Phila., list Oct. 16, '84....82½%
Mount Carmel, list Dec. 28, '99...80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Shelton Co.:
Tiger Brand, list Dec. 28, '99.....80%
Phila., Eagle, list Oct, 16,1884..82½%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$4.80*	*5.60*	*6.40*	*8.00*
Inch			*2¼*	*2½*
Per doz.....			*$8.65*	*11.50*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....30%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme .....15&10%
Perfection 40%
Seavey 40%
Stanley R. & L. Co.: Nos. 240 to 460, 30%; Nos. 50 and 60.....35%

Braces—

Common Ball, American..$1.25@1.30
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat.60@60&5%
Stanley R. & L. Co.:
Stanley, 35%; Victor.....45%

Brackets—

Wrought Steel.....70&10@75&10%
Griffin's Pressed Steel.75&10@75&10&5%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf, 75%; Sink...50%
Western, W. G. Co., Wire.....60&10%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Western, W. G. Co.....80%
Wire Goods Co.....75@75&10%

Buckets, Galvanized—

M'f'gr's list, price per gross.

	Quart..	*10*	*12*	*14*	
Water, Reg...	*25.35*	*28.00*	*32.00*		10&5%
Water, Hvy...	*45.35*	*48.00*	*52.00*		
Fire, Rd. Btm.	*32.00*	*34.65*	*38.65*		
Well	*37.35*	*41.35*	*45.35*		

Bucks, Saw—

Hoosier.....₱ gro. $36.00

Bull Rings—See *Rings, Bull*

Butts—Brass—

Wrought, High List, Oct. 26, '06. 45@45&10%
Cast Brass, Tiebout's.....40%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—*Discount*

Reversible and Broad.....70&5%
Light Reversible, Light Narrow .....70&5%
Loose Joint, Narrow, Light Inside Blind, etc.....70%
Back Flaps, Table Chest....65%

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, 10%; 1200, 8%; 200, 300, 600, 900 .....40%

Hendryx Bronze; Series 700, 800..40%
Hendryx Enameled.....40%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb., 4¼@4¾¢
Sharp, 1 prong, per lb., 4¾@5¼¢
Burke's Blunt, 4¼@4¾¢; Sharp, 4¾@5¼¢
Gautier, Blunt, 4@4¼¢; Sharp, 4½@4¾¢
Perkins', Blunt, ℔ lb, 3.65¢; Sharp, 4.15¢

Can Openers—

See *Openers, Can.*

Cans, Milk—

	5	8	10 gal.
Illinois Pattern	$1.35	1.85	2.35 each.
New York Pattern	1.50	2.20	2.45 each.
Baltimore Pattern	1.50	2.20	2.45 each.
Dubuque	1.35	1.60	1.75 each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$48.00	60.00	129.60 gro., net.

Caps, Percussion—

Eley's E. B.....52@55¢
G. D.....*per M* 34@35¢
F. L.....*per M* 40@42¢
G. E.....*per M* 48@50¢
Musket.....*per M* 62@63¢

Primers—

Berdan Primers, $2 per M..20&5%
Primer Shells and Bullets..15&10%
All other primers per M.$1.52@1.60

Cartridges—

Blank Cartridges;
32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd.$1.90
B. B. Caps, Pound Ball....$1.49
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—

Bed.....65&10%
Plate.....60&5%
Philadelphia.....70&10%
Acme, Ball Bearing.....33⅓%
Boss.....70&10%
Boss Anti-Friction.....70&10%
Gem (Roller Bearing).....80%
Martin's Patent (Phoenix).....45%
Standard Ball Bearing.....45%
Tucker's Patent low list.....30%
Yale (Double Wheel) low list.....50%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Coil—

American Coil, Straight Link:

5-16	¼	5-16	⅝	7-16	½	9-16
$8.77	6.17	5.02	4.57	4.37	4.27	4.22
⅝		¾	⅞ to 1		1⅛ to 1¼ inch.	
$4.17		4.07	4.02		4.12	

In cask lots, deduct 25¢.
German Coil.....60&10&10@70%

Halter—

Halter Chains.....60@60&5%
German Pattern Halter Chains, list July 24, '97.....60&10&5%
Covert Mfg. Co.
Halter.....35&5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Straight, with ring..$28.00
6½—6-2, Straight, with ring..$29.00
6½—8-2, Straight, with ring..$32.00
6½—10-2, Str'ght, with ring..$37.00

NOTE.—Add 2c per pair for Hooks. Twist Traces; add per pair for Nos. 2 and 3, 2c; No. 1, 3c; No. 0, 4c to price of Straight Link.
Eastern Standard Traces, Wagon Chain, &c.....60%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60&10%
Brass.....50&10%
Safety and Plumbers' Chain, 60&10%
Gal. Pump Chain.....*lb*. ¼@4½%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion.....40%
Oneida Community:
American Halter, Dog and Kennel Chains.....35&2½@40%
Niagara Dog Leads and Kennel Chains.....45@60&5%
Wire Goods Co.:
Dog Chain.....70&10%
Universal Dbl.-Jointed Chain.....50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain.....60%
Pullman:
Bronze Chain, 60%; Steel Chain, 60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft.....$1.25@$3.00
Sash Ribbon Attachments, per set..8¢

Chalk—(From Jobbers.)

Carpenters' Blue....*gro., 50@55¢*
Carpenters' Red.....*gro., 45@50¢*
Carpenters' White...*gro., 40@45¢*

Checks, Door—

Bardsley's.....45%
Pullman, per gro.....$54.00
Russwin.....33⅓%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemen's Chests, with Tools..35%
Farmers', Carpenters,' etc., Chests, with Tools.....25%
Machinists' and Pipe Fitters' Chests, Empty.....50%
Tool Cabinets.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....33⅓&10%

Chisels—

Socket Framing and Firmer

Standard List.....70&10@75%
Buck Bros.....30%
Charles Buck Edge Tool Co.....30%
C. E. Jennings & Co.:
Socket Firmer No. 10.....60%
Socket Framing No. 15.....60%
Swan's.....66⅔@70%
L. & I. J. White Co.....30@30&5%

Tanged—

Tanged Firmers.....30&5@35%
Buck Bros.....30%
Charles Buck Edge Tool Co.....30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White Co.....25&5%

Cold—

lb.
Cold Chisels, good quality..13@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary...9@10¢

Chucks—

Almond Drill Chucks.....35%
Almond Turret Six-Tool Chuck.....40%
Beach Pat., each $8.00.....35&5%
Empire.....25%
Blacksmiths'.....25%
Jacobs' Drill Chucks.....35%
Pratt's Positive Drive.....25%
Skinner Patent Chucks:
Independent Lathe Chucks.....40%
Universal, Reversible Jaws.....40%
Combination, Reversible Jaws.....40%
Drill Chucks, New Model, 25%; Standard, 40&10%; Skinner Pat., 25%; Positive Drive.....40%
Planer Chucks.....30%
Face Plate Jaws.....40%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21.....35%
Scroll Combination, Nos. 82 and 84.....30%
Geared Scroll, Nos. 33, 34 and 35..30%
Independent Iron, Nos. 18 and 318.35%
Independent Steel, No. 64.....25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104.....35%
Union Czar Drill.....25%
Universal 11, 12, 16, 17, 13, 14, 15..35%
Universal, No. 42.....30%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50.....35%
Steel Face Plate Jaws, Nos. 70 and 72.....30%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%

Clamps—

Adjustable, Hammers'.....20@20&5%
Carriage Makers', P., S. & W. Co.....40&10@50%
Besly, Parallel.....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co.....40%
Wood Workers, Hammers'.....40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable.....55%
Iwan's Champion, Stationary.....45%

Sidewalk—

Star Socket, All Steel..℔ doz. $4.05 net
Star Shank, All Steel..℔ doz. $3.24 net
W. & C. Shank, All Steel, ℔ doz., 7⅛ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros.....30%
Fayette R. Plumb.....30%
L. & I. J. White Co.....30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each.$20.00
Stewart's Enclosed Gear Horse, each.....$8.75
Stewart's Patent Sheep Shearing Machine, each.....$12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75
} 25 & 10

Clips, Axle—

Regular Styles, list July 1, '05.80%

Cloth and Netting, Wire—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c.....60&10@65%
Compression Bibbs...55&10@60%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's list.....40%

Combs, Curry—

Metal Stamping Co.....40%

Compasses, Dividers, &c.

Ordinary Goods.....70&10@75%
Wm. Schollhorn Co.:
Excelsior Dividers.....55%
Lodi Dividers.....75%

Conductor Pipe,—

L. C. L. to Dealers:

	Galvanized		
Galv. Steel.	*Charcoal Iron.*		*Copper. 14, 16&20 oz.*
Eastern:			
70%	50&5&7½%		30%
Central:			
65&10%	55&2½%		20&10%
Western and Southern:			
65&5%	50&7½%		20&7½%
So. Western			
50&25&2½%	50%		20&5%

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal. each..	2	3	4	6	8
Labrador	$1.20	$1.50	$1.80	$2.10	$2.70
Gal.	3	4	6	8	
Iceland, ea.	$1.80	$2.10	$2.40	$3.00	
Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled, 25%; Agate Lined.25%

Coopers' Tools—

See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 32@35¢; lighter than 3 lb. to pair.....34@37¢

Cord—Sash—

Braided, Drab.....*lb*. 35¢
Braided, White, Com., Nos. 8 to 12, 26¢; No. 7, 26½¢; No. 6, 27½¢.
Cable Laid Italian, lb., No. 18..37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India.....*lb., 11@11½¢*
Cotton Sash Cord, Tw'ted.18@20¢
Patent Russia.....*lb*...20¢
Cable Laid Russia.....*lb*...21¢
India Hemp, Br'd'd.....*lb*...21¢
India Hemp, Twisted..*lb*.13@14¢
Patent India, Twisted...*lb*...17¢
Anniston Cordage Co.: ℔ lb, solid Braided, Nos. 8 to 12, $0.24; No. 7, $0.24½; No. 6, $0.25½; ℔ doz., 50 ft.; Oriole, $2.00; 50 ft., Columbia, $0.85; 50 ft., Victors, $1.00; 50 ft., 6-Thread, $1.10; 60 ft., 3-Thread, $0.95; 50 ft., Manila, $1.40; 60 ft., Jute, $0.75.
Pearl Braided, cotton, No. 6, ℔ lb, 27½¢; No. 7, 26½¢; Nos. 8 to 12, 26¢
Eddystone, Braided, Nos. 8 to 12, 26¢; 7, 26½¢; 6, 27½¢.
Harmony Cable Laid Italian, Nos. 7 to 10.....℔ lb 23 ¢
Pullman:
Wire Sash Cord.....10%
Sash Cord Attachments, per doz.10¢
Samson, Nos. 8 to 12:
Braided, ℔ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord.....50¢
Massachusetts, White.....℔ lb 40¢
Massachusetts, Drab.....℔ lb 45¢
Phoenix, White, Nos. 8 to 12, 27¢;
} 15%
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen....57½¢
See also Chain and Ribbon.

Wire, Picture—

List July 10, 1906...85&10&10@—
Hendryx Standard Wire Picture Cord, old list, 85&10%
Turner & Stanton Co. Wire Picture Cord.....90%

Cradles—

Grain.....40&12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber.....℔ gro.
White and Purple, Indelible....$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black.....$4.00
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $16.25; Indelibles.....$18.75
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3-16.....$3.00

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $7.00; Light.....$6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847.℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....℔ doz. $3.00
Wm. Rogers & Son.....℔ doz. $2.50

Cutters—Glass—

H. H. Mayhew Co.....40%
Red Devil.....50%
Smith & Hemenway Co.....50%
Woodward.....40%

Meat and Food—

American.....30%

Nos.	401	402	403	404	405	406	407
Each	$5	$7	$10	$12	$25	$30	$60

Enterprise:

Nos.	5	10	12	22	32	
Each	$2	$3	$2.75	$4.50	$6	25@25&7½%
No. 202, $1.50						40&7½%

Dixon's.....℔ doz. 30@30&5%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal.....40@40&5%
Little Giant.....℔ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

N. E. Food Choppers.....25%
New Triumph No. 605, ℔ doz. $24.00.....40@50%
Russwin Food, No. 1, $24.00; No. 2, $27.00.....45&10&10%
Woodruff's.....℔ doz. 30@30&5%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters.....35%
Corn Graters.....30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....℔ doz. $3.00
Combined Slaw Cutter and Corn Grater.....℔ doz. $4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife..℔ gr. $18@$20
Slaw Cutters, 2 Knife..℔ gr. $22@$36

Tobacco—

All Iron, Cheap..*doz. $4.25@$4.50*
Enterprise.....25@30%
National, ℔ doz., No. 1, $21; No. 2, $18.....40%

Diggers, Post Hole, &c.—

Disston's:
Rapid, ℔ doz., $24.00.....25%
Samson, ℔ doz., $34.00.....25%
Iwan's Imp'ved Post Hole Auger.40&5%
Vaughan Pattern Post Hole Augers, ℔ doz., $6.25
Perfection Post Hole Diggers, ℔ doz.....$8.75
Split Handle Post Hole Diggers, ℔ doz., $7.75
Kohler's, ℔ doz., Universal, $14.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.00; Pioneer.....$7.00
Never-Break Post Hole Diggers, ℔ doz., $24.00.....60%

Dividers—See *Compasses.*

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, ℔ doz., $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—

See *Knives, Drawing.*

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers.....35%
Sterling Wheel Dresser Cutters.....35%

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines.....$1.50@$1.75
Breast, Millers Falls.....15&10%
Breast, P., S. & W.....40%
Goodell Automatic Drills.50&10@60&10%
Johnson's Automatic Drills, Nos. 2 and 3.....16⅔%
Johnson's Drill Points.....16⅔%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....40%
Ratchet, Weston's, Style H Improved.....40%
Ratchet, No. 012.....40%
Ratchet, Celebrated.....40%
Ratchet, Whitney's, P., S. & W..50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....60&10&10@70%
Taper and Straight Shank....60&10@60&10&5%

Drivers, Screw—

Screw D'ver Bits, per doz..45@50¢
Balsey's Screw Holder and Driver, ℔ doz., 2½-in., $6; 4-in., $7.50; 6-in., ℔.....50%
Buck Bros.' Screw Driver Bits.....30%
Champion.....50%
Disston's.....70%
Edson.....60%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers....40&10%
Gay's Double Action Ratchet.....35%
Goodell's Auto.....65@65&10%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40%
Millers Falls, Nos. 20 and 21...25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
New England Specialty Co.....30%
Smith & Hemenway Co., Neverturn, 40&5%; Elmore.....50%
H. D. Smith & Co.'s Perfect H'dle.40%
Stanley R. & L. Co.'s:
No. 64, Varn. Handles, 60&10%; No. 86, 70%; Defiance, 70%; Hurwood, 55%.
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L. Galvanized*		
Galv. Steel.	*Charcoal Iron.*		*Copper. 14, 16&20 oz.*
Eastern:			
70&30%	70%		30%
Central:			
75&10&2½%	65&10%		20&10%
Western and Southern:			
75&7½%	65%		20&7½%
So. Western:			
75%	60&10%		20&5%

Terms, 2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel and Galv. C. I.
Standard Gauge.....80%
No. 26.....50%
No. 24.....25%
No. 22.....10%
Copper.....40&10%

Elbows, Stove Pipe—

Edwards, Standard Blue.....40&10&10%
Edwards, Royal Blue.....40&10&10%
Dover, one piece (R. M. Co.)....40&10%
Perfect Elbows.....40%

Emery, Turkish—

	4 to 4/6:	*5½ to 220:*	*Flour.*
Kegs.....*lb*.	5 ¢	5½¢	5½¢
½ Kegs.....*lb*.	5½¢	5¾¢	5¾¢
¼ Kegs.....*lb*.	5½¢	6 ¢	6 ¢
10-lb. cans, 10 in case....	6½¢	7 ¢	8 ¢
10-lb. cans, less than 10.....	10 ¢	10 ¢	8 ¢
Less quantity..	10 ¢	10 ¢	8 ¢

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's ..... 50&10%
Watling's ..... 40&10%

Cord and Weight—
Ives 33⅓%

Faucets—
Cork Lined ..... *50@50&10%*
Metallic Key, Leather Lined .. *60&10@70%*
Red Cedar ..... *40&10@50%*
Petroleum ..... *70&10@75%*
B. & L. B. Co.:
Metal Key ..... 60&10%
Star 60%
West Lock ..... 50&10%
John Sommer's Peerless Tin Key 40%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Mtl. Key ..... 50&10%
John Sommer's Duplex Metal Key 40%
John Sommer's Diamond Lock 40%
John Sommer's I. X. L. Cork Lined 50%
John Sommer's Reliable Cork Lined .. 50&10%
John Sommer's Chicago Cork Lined 60%
John Sommer's O. K. Cork Lined 50%
John Sommer's No Brand, Cedar 50%
John Sommer's Perfection, Cedar 40%
McKenna, Brass:
Burglar Proof, N. P. 25%
Improved, ⅝ and ¾ inch 25%
Self Measuring:
Enterprise, ℔ doz. $36.00 ..... 40&10%
Lane's, ℔ doz. $36.00 ..... 40&10%
National Measuring, ℔ doz. $36 ..... 40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List Nov. 1, 1899.
Best Brands ..... *70&10@75&10%*
Standard Brands ..... *75&10@75&10&10%*
Lower Grade ..... *75&10&10@80&10%*

Imported—
Stubs' Tapers, Stubs' list, July 24, '97 ..... *33 1-3@40%*

Fixtures, Fire Door—
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 ..... $3.75
Fusible Links, No. 96 ..... 50%
Expansion Bolts, No. 107 ..... 60&10%

Grindstone—
Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz	*$3.25*	*3.75*	*4.25*	*4.75*

P., S. & W. Co. ..... 30&10%
Reading Hardware Co. 60%
Stowell's Giant Grindstone Hanger .. ℔ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy, 40&10%; Light 50%

Fodder Squeezers—
See *Compressors.*

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Ezy Potato ..... 60&10%
Victor, Hay ..... 60&15&2½%
Victor, Manure 66⅔%
Victor, Header 65%
Champion, Hay 66⅔%
Champion, Header 65%
Champion, Manure ..... 60&15&2½%
Columbia, Hay ..... 60&20%
Columbia, Manure 70%
Columbia, Spading ..... 70&12½%
Hawkeye Wood Barley 40%
W. & C. Potato Digger ..... 60&10%
Acme Hay ..... 60&20%
Acme Manure, 4 tine ..... 40&10&5%
Dakota Header ..... 60&20%
Jackson Steel Barley ..... 60&20%
Kansas Meader 65%
W. & C. Favorite Wood Barley 40%
Plated.—See Spoons.

Frames— Saw—
White, S'g't Bar, per doz ..... *75@80¢*
Red, S'g't Bar, per doz ..... *$1.00@1.25*
Red, Dbl. Brace, per doz ..... *$1.40@1.50*

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	*$1.30*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp *$2.75*
Cotton *3.20*
Waterproof Sgl. Taped *3.65*
Waterproof Dbl. Taped *4.40*
Waterproof Tpl. Taped *5.15*
} 25%

Gates, Molasses and Oil—
Stebbins' Pattern ..... *80&10%*

Gauges—
Marking, Mortise, &c. ..... *50@50&10%*
Chapin-Stephens Co.:
Marking, Mortise, &c. ..... 50&50&10%
Disston's Marking, Mortise, &c. 67½%
Stanley R. & L. Co.'s Butt and Rabbet Gauge 30%
Marking and Mortise 55%
Wire, Brown & Sharpe's 33⅓%
Wire, Morse's 25%
Wire, P., S. & W. Co. 30%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1 ..... *$2.00; 2. $2.80*
Spike, Metal, No. 1 ..... *$4.00; 2. $4.80*
Nail, Wood Handled, No. 1 ..... *$2.80; 2. $2.60*
Spike, Wood Handled, No. 1 ..... *$4.80; 2. $4.60*

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co. ..... 65@65&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush .. *25&10@50%*
International Glue Co. (Martin's) .. 40%

Grease, Axle—
Common Grade ..... *gro. $4.50@6.00*
Dixon's Everlasting, 10-lb pails, ea. 85¢; in boxes, ℔ doz., 1 lb, $1.20; 2 lb $2.00
Helmet Hard Oil 25%

Griddles, Soapstone—
Pike Mfg. Co. ..... 33⅓@33⅓&10%

Grindstones—
Pike Mfg. Co.:
Improved Family Grindstones, ℔ inch, ℔ doz., $2.00 ..... 33⅓%
Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 ..... 30%
Alundum Sickle Grinders, each, Nos. 20A, $6.00; 20A Combined, $6.50 ..... 30%
Alundum Disc Grinders, each, $2.50 ..... 30%

Grips, Nipple—
Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—
Cow Ties ..... *60&5@60&10%*
Covert Mfg. Co.:
Web ..... 30&2%
Jute Rope 35%
Sisal Rope 20%
Cotton Rope 45%
Hemp Rope 45%
Oneida Community:
Am. Coil and Halters ..... 40@40&5%
Am. Cow Ties ..... 45@50%
Niagara Coil and Halters ..... 45@50&5%
Niagara Cow Ties ..... 45&5@50&10&5%

Hammers—
Handled Hammers—
Heller's Machinists' ..... 65&10@55&10&5%
Heller's Farriers' ..... 40&5@40&10&5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75 ..... 50%
Peck, Stow & Wilcox, Steel 50%
Fayette R. Plumb:
A. E. Nail ..... 40&2½@40&12½%
Eng. and B. S. Hand ..... 50&12½@60%
Machinists' Hammers ..... 50&15@60&5%
Rivet and Tinners' ..... 40&2½@40&12½%
Vaughan & Bushnell Mfg. Co.:
A. E. Nail ..... 40&2½@40&12½%
Machinists' ..... 50&15@60&5%

Heavy Hammers and Sledges—
Under 3 lb., per lb. ..... *50¢.80&5@..%*
3 to 5 lb., per lb. ..... *40¢.80&5@..%*
Over 5 lb., per lb. ..... *30¢..... 80&10&5@..%*
Wilkinson's Smiths' ..... lb. *9½@10¢*

Handles—
Agricultural Tool Handles
Axe, Pick, &c. ..... *6%&10@60&10&5%*
Hoe, Rake, &c. ..... *40@45&5%*
Fork, Shovel, Spade, &c.:
Long Handles ..... *40@45&5%*
D Handles *40%*
Cross-Cut Saw Handles—
Atkins' 40%
Champion 50%
Disston's 50%
Mechanics' Tool Handles—
Auger, assorted ..... *gro. $2.50@$3.00*
Brad Awl ..... *gro. $1.65@$1.75*
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@$2.65; Hickory ..... *$2.15@2.40*
Socket Firming, Apple, $1.75@$1.95; Hickory ..... *$1.45@$1.60*
Socket Framing, Hickory, $1.60@$1.75
File, assorted ..... *gro. $1.30@$1.40*
Hammer, Hatchet, &c. ..... *60&10@60&10&5%*
Hand Saw, Varnished, doz. 80&85¢; Not Varnished ..... *65@75¢*
Plane Handles:
Jack, doz. 80¢; Jack, Bolted ..... *75¢*
Fore, doz. 45¢; Fore, Bolted ..... *90¢*
Chapin-Stephens Co.:
Carving Tool ..... 40@40&10%
Chisel ..... 65@65&10%
File and Awl ..... 65@65&10%
Saw and Plane ..... 40@40&10%
Screw Driver ..... 40@40&10%
Millers Falls Adj. and Ratchet Auger Handles ..... 20&10%
Nicholson Simplicity File Handle .... ℔ gro. $0.85@$1.50
W. A. Zelnicker Supply Co.:
Hammer, per doz., 12 in., $2.00; 14 in., $2.00; 16 in., $2.30; 18 in., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge, per doz., oval 30 in., $3.80; octagon, 30 in., $3.80; oval, 36 in., $4.00; octagon, 36 in., $4.00.
Axe, per doz., 28 to 34 in., $5.60; 36 in., $5.80.
Adze, per doz., 36 in., $5.80; 36 in., $7.80.
Pick, per doz., R. R., 36 in., $8.00; coal, 34 in., $5.80.
Hatchet, per doz., 12 to 14 in., $2.00.

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.
Allith Mfg. Co.:
Reliable, No. 1; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door 50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 60&10%
Roller Bearing 70%
Griffin Mfg. Co.:
Solid Axle, No. 19, $12.00 ..... 70%
Roller Bearing, No. 11, $15.00 ..... 70%
Roller Bearing, Ex. Hy., No. 22, $18.00 ..... 70%
Hinged Hangers, $16.00 ..... 60&10%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard ..... 60&5%
Hinged ..... net $6.08
Covered ..... 60&2%
Special ..... 70&5%
Lawrence Bros.:
Advance and Sterling ..... 60&2½%
Cleveland and Peerless ..... 70&7½%
Clipper, No. 75 ..... 60&5%
Crown ..... 60&2½%
Cyclone-Tandem ..... net $7.50
Easy Parlor Door, Dbl. Sets, $2.50; Single Sets, $1.25 ..... 60%
Giant 60%
Hummer ..... 70&7½%
New Cyclone, Flexible, $16.00 ..... 60%
New York ..... 60&2½%
McKinney Mfg. Co.:
No. 1, Special, $15 ..... 60&10%
No. 2, Standard, $18 ..... 60&10%
Hinged Hangers, $16 ..... 50%
Meyers' Stayon Hangers ..... 60&5%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3 ..... $2.25
Roller B'r'g St'l Track No. 12 ..... $2.20
Roller B'r'g St'l Track No. 13 ..... $2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19 ..... 50&10%
Adjustable Track Tandem Trolley Track No. 16 ..... 50&10%
Seal, Steel Track No. 8 ..... $2.25
Auto Adj. Track No. 22 ..... 50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150 ..... $2.50
Safety Underwriters F. D. No. 101 ..... 50%
Tandem No. 44, 2½ and 3 ..... 60&10%
Palace, Adjustable Track No. 122 ..... 50&5%
Royal, Adjustable Track No. 122 ..... 50&10%
Ives' Wood Track No. 1 ..... $2.25
Trolley B. D. No. 20 ..... 50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2 ..... 70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3 ..... 60%
Hinged Tandem No. 48 ..... 60&5%
Folding Door B. B. Swivel No. 135 ..... 40%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing 30%
Ajax Hinge Door 60%
Apex Parlor Door ..... 50&10&5%
Atlas 60%
Baggage Car Door 50%
Climax Anti-Friction 50%
Elevator 40%
Express 50%
Lundy Parlor Door 50%
Matchless 60%
Nansen 70%
Parlor Door, 50&10%; Railroad, 50&10%
Steel, Nos. 300, 404, 500 ..... 50%
Underwriters' Fire Door 40%
Wild West Warehouse Door 50%
Wilbern, No. 0, net ℔ doz. $9.00
Zenith for Wood Track 50%
A. L. Sweet Iron Works:
Check Back, 70%; Eagle 70%
Climax Anti-Friction ..... 50&10%
Hylo Hinge, New Perfection, Pilot, Pilot Hinge 60%
Rider Wooster 65%
Western Pattern 70%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing ..... 50&15&10&5%

Hangers— Garment—
Pullman Trouser, ℔ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $10.50; Garment Hanger Loops, Round Nickeled, per gro. $10.50
Victor Folding ..... ℔ gro. $9.60
Western, W. G. Co. ..... 75&10%

Gate—
Myers' Patent Gate Hangers, ℔ doz. net $4.50

Joist and Timber—
Lane Bros. Co. 30%

Hasps—
Griffin's Security Hasp ..... 50&10%
McKinney's Perfect Hasp, ℔ doz. 50%

Hatchets—
Regular list, first qual. ..... *40&7½%—*
Second quality ..... *50&10@—*

Heaters, Carriage—
Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. TD, $3.00; No. 3E, $3.25; No. 1, $3.50 ..... 25%
Clark Coal, ℔ doz., $0.75 ..... 20%

Hinges—
Blind and Shutter Hinges—
Surface Gravity Locking Blind:
(Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair	*$0.75*	*1.35*	*2.70*

Mortise Shutter:
(L. & P., O. S., Dixie, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Charles Parker Co. ..... 70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00 ..... 20%
Reading's Gravity 60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ℔ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter ..... 70&10&2½%
Acme, Lull & Porter ..... 70&5&2½%
Queen City Reversible ..... 70&5&2½%
Shepard's Noiseless, Nos. 60, 65, 55 ..... 70&10&2½%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 10&10&2½%
1868, Old Pat'n, No. 1 ..... 75%
Nos. 3 & 5 ..... 70&10&2½%
Tip Pat'n, No. 1 ..... 75%
No. 3 ..... 70&10&2½%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 70&5%
Shepard's Double Locking ..... 70&5&2½%
Champion Gravity Locking ..... 70&10&2½%
Pioneer 75%
Empire 60%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L'tch's	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.35*

New England:
With Latch ..... *doz. ...@$2.00*
Without Latch ..... *doz. ...@$1.60*
Reversible Self-Closing:
With Latch ..... *doz. ...@$1.75*
Without Latch ..... *doz. ...@$1.35*
Western:
With Latch ..... *doz. $1.75*
Without Latch ..... *doz. $1.15*
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3 ..... 65&5%

Pivot Hinges
Bommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 50%

Spring Hinges—
Holdback, Cast Iron ..... *$6.50@$7.00*
Non-Holdback, Cast Iron ..... *$6.25@$6.75*
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges 40%
Bardsley's Patent Checking 33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor 40%
Bommer Spring Hinges 40%
No. 999 Wrot. Steel Hold Back, ℔ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor 50%
Garden City Engine House 25%
Keene's Saloon Door 25%
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme, Brass 25%
American 30%
Columbia, ℔ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ℔ gr. $12.00
Columbian Hinges ..... 60&10%
Gem, new list 30%
Clover Leaf ..... ℔ gr. $12.00
Oxford, new list 30%
Floor Spring Hinges ..... 65&10%
Lawson Mfg. Co. Matchless 30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door ..... ℔ gr. $9.00
Chief Ball Bearing Floor Hinge 50%
Ball Bearing Door 25%
No. 777, Sheet Steel Holdb'k, ℔ gr. pr. $9.00
Superior Spring Hinge Co.:
Superior Floor Hinges 33⅓%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ℔ gr. $12.50
Ideal, No. 4 ..... ℔ gr. $9.00
New Idea No. 1 ..... ℔ gr. $9.00
New Idea, Double Acting 50%
New Idea Floor 50%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges 60%
Heavy Strap Hinges 65%
Light T Hinges 55%
Heavy T Hinges 45%
Extra Heavy T Hinges 60%
Hinge Hasps 40%
Cor. Heavy Strap 65%
Cor. Ex. Heavy T 60%
} *Extra 10&10@*

Screw Hook and Strap.
6 to 12 in. ..... *lb. 3¼¢*
14 to 20 in. ..... *lb. 3½¢*
22 to 36 in. ..... *lb. 3¾¢*

Screw Hook and Eye:
⅝ to 1 inch ..... *lb. 6¼¢*
⅝-inch ..... *lb. 7¼¢*
½-inch ..... *lb. 8¼¢*

Extra 10% often given.

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—
M'f'gr's list, price per gross.

Inch	15	16	17	18	
Galv. Open	$35	$39	$42	$46	10&5%
Jap. Open	26	28	31	35	
Galv. Funnel	43	48	52	56	
Jap. Funnel	33	36	39	43	

Masons' Etc.—
Cleveland Wire Spring Co.:
Steel Brick, No. 163.....each $1.05
Steel Mortar, No. 153.....each $1.35

Hoes— Eye—
Scovil and Oval Pattern.....
60&10@60&10&10%
Grub, list Feb. 23, 1899.....
70&10@75&10%
D. & H. Scovil.....30%

Handled—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Cronk's Weeding, No. 1, $2.75; No. 2, $2.50
Star Double Bit.....$3.20
Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ₱ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....₱ doz. 66⅔%
Junior Size.....₱ doz. $4.00
Ft. Madison Sprouting Hoe..₱ doz. 50%
Ft. Madison Dixie Tobacco Hoe.....
75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in. Cultivator Hoe.....$3.15
B. B., 6½ in.....$3.35
Acme Wedding.....₱ doz., net, $4.35
W. & C. L'ting Shuffle Hoe, ₱doz.$4.85

Hoisting Apparatus—
See *Machines, Hoisting.*

Holders— Bit—
Angular, ₱ doz. $24.00.....45&10%

Door—
Bardsley's, Iron, 40%; Brass and Bronze.....33⅓%
Empire.....50%
Pullman.....35%
Superior.....33⅓%

File and Tool—
Nicholson File Holders and File Handles.....33⅓@40%

Fruit Jar—
Triumph Fruit Jar Holder, ₱ gross, $10.80; ₱ doz.....$1.25

Trace and Rein—
Fernald Double Trace Holder, ₱ doz. pairs.....$1.25
Dash Rein Holder, ₱ doz. pairs..$1.25

Hones—Razor—
Pike Mfg. Co., Belgian, German and Swaty.....50%

Hooks—Cast Iron—
Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Clothes Line, Stowell's.....70%
Coat and Hat; Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....40%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—
Belt.....80%
Wire C. & H. Hooks:.....
75@75&10%
Columbian Hdw. Co., Gem.....70&5%
Parker Wire Goods Co., King..70&10%
Western W. G. Co. Molding.....75%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—
Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $3.50.
Cotton.....*doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.—
See Wrought Goods

Miscellaneous—
Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz. $4.75; Medium, $5.35; Heavy, $6.25
Grass, best, all sizes, per doz.$1.60
Grass, common grades, all sizes, per doz.....*$1.30*
Whiffletree.....*lb. 5¾@6¢*
Hooks and Eyes:
Brass.....*60&5@60&10&5%*
Malleable Iron.....*70@70&10%*
Covert Mfg. Co. Gate and Scuttle Hooks.....40%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $3.25 net
Turner & Stanton Co. Cup and Shoulder.....80&10&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—
See *Nails, Horse.*

Horseshoes—
See *Shoes, Horses.*

Hose, Rubber—
Garden Hose, ¾-inch:
Competition.....*ft. 5 @ 6 ¢*
3-ply Guaranteed..*ft. 8 @ 9 ¢*
4-ply Guaranteed..*ft. 10 @11 ¢*
Cotton Garden, ¾-in., coupled:
Low Grade.....*ft. 8 @ 9 ¢*
Fair Quality.....*ft. 10 @11 ¢*

Irons— Sad—
From 4 to 10.....*lb. 3 @3¼¢*
B. B. Sad Irons.....*lb. 3¼@3½¢*
Mrs. Potts', cents per set:

	Nos. 50	55	60	65
Jap'd Tops	80	77	90	88
Tin'd Tops	85	82	95	92

New England Pressing.lb. 3¼@4¢

Pinking—
Pinking Irons.....*doz. 60¢*

Irons, Soldering
See *Copp.ers.*

Jacks, Wagon—
Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Lockport.....50%
Lane's Steel.....30&10&2%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Kettles—
Brass, Spun, Plain.....*20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—
Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....60%

Corn—
Wilkinson Shear & Cutlery Co., Wilcut Brand Knives and Hooks.60%
Withington Acme, ₱ doz. $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—
Standard List.....*75&5@75&10%*
C. E. Jennings & Co., Nos. 45, 46..60%
Jennings & Griffin, Nos. 41, 42.....75%
Swan's.....66⅔@70%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—
Serrated Edge, per doz.$5.50@5.75
Iwan's Sickle Edge.....₱ doz. $9.50
Iwan's Serrated.....₱ doz. $10.00

Mincing—
Buffalo.....₱ gro. $13.00

Miscellaneous—
Farriers'.....*doz. $3.00@3.25*
Westenholm's.....₱ doz. $3.00@3.25

Knobs—
Base, 2½-inch, Birch, or Maple, Rubber Tip.....*gro $1.25@$1.40*
Carriage, Jap., all sizes.....
gro. 40@45¢
Door, Mineral.....*doz. 65@70¢*
Door, Por. Jap'd.....*doz. 70@75¢*
Door, Por. Nickel..*doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—
See *Belting, Leather—*

Ladders, Store, &c.—
Allith Mfg. Co., Reliable.....50%
Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—
L. & G. Mfg. Co. (low list).....25%
P. S. & W.....40&10%
Reading.....60%

Lanterns—Tubular—
Regular Tubular, No. 0.....
doz.$4.25@4.50
Lift Tubular, No. 0.....
doz.$4.75@5.00
Hinge Tubular, No. 0.....
doz.$4.75@5.00
Other Styles.....*40@40&5%*

Bull's Eye Police—
No. 1, 2¾-inch.....*$2.75@3.00*
No. 2, 3-inch.....*$3.00@3.25*

Lasts and Stands, Shoe—
Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches— Thumb—
Roggin's Latches, with screw..
doz. 35@40¢

Door—
Allith Mfg. Co., Automatic, No. 400, ₱ doz.....$4.00
Cronk & Carrier Mfg. Co., No. 101, ₱ doz. $2.30
Cronk & Carrier Mfg. Co., Latch, Hasp and Staples.....50%
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50
Stowell's Steel.....50%

Leaders, Cattle—
Small.....*doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Lifters, Transom—
R. & E.....10%

Lines—
Wire Clothes, Nos. 18 19 20
100 feet.....*$2.25 2.00 1.75*
75 feet.....*$1.75 1.55 1.10*
Anniston Waterproof Clothes, 50 ft., ₱ gro., $25.00; Gilt Edge, $23.00; Air Line, $23.00; Acme, $18.00; Alabama, $17.00; Empire, $16.00; Advance, $14.00; Eclipse, $13.50; Chicago, $11.50; Standard, $10.50; Columbia, $9.50; Allston, $13.50; Calhoun, $12.00.
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....₱ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3/4, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3/4, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3/4, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%

Locks— Cabinet—
Cabinet Locks.....*33⅓%*

Door Locks, Latches, &c.—
NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....10%

Elevator—
Stowell's.....50%

Padlocks—
R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—
Ives' Patent:
Bronze and Brass, 60%; Crescent, 40&20%; Iron, 60%; Window Ventilating, 55%; Robinson Pat. Ventilating Sash Lock, 33⅓%; Wrought Bronze and Brass, 55%; Wrought Steel, 55%.
Pullman Patent Ventilating Lock..35%
Reading.....40%

Machines—Boring—
Com. Upr't, without Augers.
$2.00@2.25
Com. Angl'r, without Augers,
$2.25@2.50
Swan's Improved.....40&10%
Jennings', Nos. 1 and 4.....33⅓%
Millers' Falls.....5.75
Snell's, Upright, $2.65; Angular, $2.90

Corking—
Reisinger Invincible Hand Power.....
₱ doz. $48.00

Fence—
Williams' Fence Machines....each. $5.50

Hoisting—
Moore's Anti-Friction Chain Hoist.30%
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Cyclone High Speed Chain Hoist.....25%

Ice Cutting—
Chandler's.....12½%

Washing
Boss Washing Machine Co.: Per doz.
Boss No. 1.....$57.00
Boss Rotary.....$57.00
Champion Rotary Banner No. 1.$57.00
Standard Champion No. 1.....$50.00
Standard Perfection.....$27.00
Cincinnati Square Western.....$33.00
Uneeda American, Round.....$33.60

Mallets—
Hickory.....*45&5@50%*
Lignumvitæ.....*45&5@50%*
Tinners' Hickory and Applewood.....*doz. 45&5@50%*

Mangers, Stable—
Swett Iron Works.....50%

Mashers, Vegetable—
Western, W. G. Co., Potato....60&10%

Mats, Door—
Elastic Steel (W. G. Co.), new list.50%
Keystone Wire Matting Co.:
Keystone.....50%
Ideal.....50%

Mattocks—
See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—
Enterprise Mfg. Co.....20@25%
National list Jan. 1, 1902.....30%
Parker's Columbia & Victoria.50&10@60%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros. Co.....30%

Motors Water—
Divine's Red Devil.....30%

Mowers, Lawn—
NOTE.—Net prices are generally quoted
Cheapest.....*all sizes, $1.85@2.00*
Cheap.....*all sizes, $2.00@2.50*
Better Grade..*all sizes, $2.50@4.50*
12 14 16 18-in.
High Grade....*$4.50 4.75 5.00 5.25*
Continental.....60&5%
Great American.....70%
Great American Ball B'r'g, new list.70%
Quaker City.....70%
Pennsylvania.....60&5%
Pennsylvania, Jr., Ball Bearing....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Granite State:
Style A, Low Wheel.....70&10&10%
Style B, Low Wheel.....70&10%
Style C, High Wheel, spcl. disct., 70&10%
Style D, High Wheel, spcl. disct.70%
Philadelphia:
Styles M., S., C., K., T....70&10&5%
Style A, all Steel.....60&10&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list.40%
Horse.....40&5%
Pony.....40&5%
36-in., Horse.....30&10%
Eagle Horse.....30&5%
I. X. L. Horse.....50%

Nails—
Wire Nails and Brads, Miscellaneous.....*87½@87½&10%*
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	...40&5%
Champlain	28	26	25	24	23	.....50%
Coleman	13	12	12	11	11	.....net
New Haven	23	21	20	19	18	...40&5%
Livingston	19	18	17	16	16	.....10%
Western						₱ lb 8¼¢

Jobbers' Special Brands.....
per lb. 9@10¢

Picture—

	1½	2	2½	3	4in.
Brass H'd.	.45	.55	.60	.70	.. gro
Por. Head	..	1.10	1.10	1.10	.. gro

Nippers—
See *Pliers and Nippers.*

Nuts—
Cold Punched: *Off list*
Square, Blank or Tapped..4.80¢
Hexagon, Blank or Tapped.5.10¢
Square, Bl'k, C., T. & R...5.10¢
Hexagon, Bl'k, C., T. & R.5.70¢
Hot Pressed:
Square, Blank.....*5.00¢*
Hexagon, Blank.....*5.40¢*
Square, Tapped.....*4.70¢*
Hexagon, Tapped.....*5.10¢*

Oakum—
Best.....*lb., 6½¢*
U. S. Navy.....*lb., 6¢*
Navy.....*lb., 5¢*
Plumbers' Spun Oakum.....*5⅜¢*
In carload lots ⅛¢ lb. off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—
Brass and Copper.....*50&10%*
Tin or Steel.....*65&10&5@70%*
Zinc.....*65&10&5@70%*
Chase or Paragon:
Brass and Copper.....*50&10%*
Tin or Steel.....*65&10%*
Zinc.....*65&10%*
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can— *Per doz.*
Sprague, Iron Handle....*30@35¢*
Sprague, Wood Handle...*35@40¢*
Sardine Scissors.....*$1.75@$3.00*
Vim Tin Shear and Can Opener, ₱ doz., 75c.; per gro., $7.50
Yankee Can and Bottle Opener, ₱ doz., net.....$0.75

Egg—
Nickel Plate, ₱ doz., $2.00; Silver Plate, $4.00.

Packing—
Asbestos Packing, Wick and Rope.....*20@25¢*

Rubber—
(Fair quality goods.)
Sheet, C. I.....*11@12¢*
Sheet, C. O. S.....*11@12¢*
Sheet, C. B. S.....*12@13¢*
Sheet, Pure Gum.....*40@45¢*
Sheet, Red.....*40@50¢*
Jenkins' '96, ₱ lb. 80¢.....25%

Miscellaneous—
American Packing...*lb. 7@10 ¢*
Cotton Packing.....*lb. 16@25 ¢*
Italian Packing.....*lb. 9@12½¢*
Jute.....*lb. 4@ 4½¢*
Russia Packing.....*lb. 8@11 ¢*

Pails, Creamery—
R. M. Co., with gauges, ₱ doz., No. 1, $6.25; No. 2, $6.50.

Pails, Water, Well, &c.—
See *Buckets.*

Fans— Dripping—
Standard List.....*70&10%*
Edwards, Royal Blue.....65&7½%

Fry—
Common Lipped:

Nos.	1	2	3	4	5
Per doz.	$0.75	0.80	0.90	1.10	1.30

Refrigerator, Galva.—

Inch	12	14	16	18
Per doz.	$1.75	2.25	2.80	3.15

Roasting and Baking—
Regal, R. M. Co., ₱ doz., Nos. 8, $4.50; 10, $5.25; 20, $5.75; 30, $6.25.
Savory, ₱ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ₱ gro.:

No.	40	50	60	140	150	160
	$30.00	35.00	42.00	34.00	39.00	46.00

Paper—Building Paper
Asbestos: *lb.*
*Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.*3½@5¢*
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft.....*6¢*
Mill Board, Sheet, 40 x 40 in., 1-32 to ½ in.....*36@5¢*
Per roll
Rosin Sized Sheathing; 500 sq. ft. Light weight, 25 lbs. to roll
40@50¢
Medium weight, 30 lbs. to roll.
50@55¢
Heavy weight, 40 lbs. to roll..
65@70¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....*$30.00*
Red Rope Roofing, 250 sq. ft. per roll.....*$1.75*

Tarred Paper—
1 ply (roll 400 sq. ft.), ton....
$31.00@$35.00
2 ply, roll 108 sq. ft.....*57¢*
3 ply, roll 108 sq. ft.....*80¢*
Slater's Felt (roll 500 sq. ft.).76¢

Sand and Emery—
Flint Paper and Cloth.50&10@—%
Garnet Paper and Cloth..*25%*
Emery Paper and Cl'h..50&10@60%

Parers— Apple—
Advance.....₱ doz. $4.00
Baldwin.....₱ doz. $4.00
Bonanza Improved.....each $6.50
Daisy.....₱ doz. $4.00
Dandy.....each $7.50
Eureka Improved.....each $20.00
Family Bay State.....₱ doz. $15.00
Improved Bay State.....₱ doz. $36.00
Little Star.....₱ doz. $5.00
New Lightning.....₱ doz. $7.00
Reading 72.....₱ doz. $3.25
Reading 78.....₱ doz. $6.25
Rocking Table.....₱ doz. $6.20
Turn Table 72.....₱ doz. $5.00
White Mountain.....₱ doz. $5.00

Potato—
Saratoga ..... ℔ doz. $7.00
White Mountain..... ℔ doz. $6.00

Picks and Mattocks—
List, Feb. 23, 1899..70&5@70&10%
Cronk's Handled Garden Mattock, ℔ doz., No. 2, $2.60; No. 3, $6.40.

Pinking Irons—
See *Irons, Pinking.*

Pincers—
Vaughan & Bushnell Mfg. Co.:
Blacksmiths', per doz., 10 in., $5.00; 12 in., $5.50; 14 in., $6.00.
Carpenters' Claw, per doz., 6 in., $2.00; 8 in., $2.75; 10 in., $3.50.

Pins, Escutcheon—
Brass ..... 50&10@60%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—
Carload lots.
*Standard, 2-6 in.*50&10@50&10&5%
Extra Heavy, 2-6 in......65&10%
Fittings .....70&10@70&10&5%

Pipe, Merchant—
Consumers, Carloads.

	Steel.		*Iron.*	
	Blk.	*Galv.*	*Blk.*	*Galv.*
	%	%	%	%
⅛ & ¼ in...	*66*	*50*	*59&5*	*43&5*
⅜ in.....	*68*	*54*	*61&5*	*43&5*
½ in.....	*70*	*58*	*63&5*	*51&5*
¾ to 6 in...	*74*	*64*	*68&5*	*58&5*
7 to 12 in...	*69*	*54*	*63&5*	*48&5*

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First-class 84%
Second-class 87%
NOTE.—Market irregular.

Pipe, Stove—

	Per 100 joints.	
Edwards' Nested:	C. L.	L. C. L.
5 in., Standard Blue....	$6.25	$7.25
6 in., Standard Blue....	6.75	7.75
7 in., Standard Blue....	7.75	8.75
5 in., Royal Blue.....	7.00	8.00
6 in., Royal Blue.....	7.50	8.50
7 in., Royal Blue.....	8.50	9.50

Planes and Plane Irons—
Wood Planes—
Bench, first qual.....30@30&10%
Bench, second qual...40@40&10%
Molding ..... 25@25&10%
Bailey's (Stanley R. & L. Co.) .35&2½%
Chapin-Stephens Co.:
Bench, First Quality..... 30%
Bench, Second Quality..... 40%
Molding and Miscellaneous..... 25%
Toy and German..... 30%
Union 60%

Iron Planes—
Bailey's (Stanley R. & L. Co.)....35%
Chapin's Iron Planes.....50&10%
Miscellaneous Planes (Stanley R. & L. Co.)..... 30&5%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06..... 25%
Buck Bros..... 30%
Chapin-Stephens Co..... 25%
Stanley R. & L. Co..... 35%
Union 50%
L. & I. J. White..... 20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse..... ℔ doz. $3.00

Plates—
Felloe ..... *lb.* 4@4¼¢
Self-Sealing Pie Plates (R. M. Co.). ℔ doz. $2.00..... 50%

Pliers and Nippers—
Button Pliers.....75@75&10%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe.. 7 | 8 | 10 | 12-in.
$2.00 | $2.25 | $2.75 | $3.50
Acme Nippers..... 50&5%
Cronk & Carrier Mfg. Co.:
American Button..... 60%
Improved Button.....75&10%
Cronk's 60%
No. 80 Linemen's..... 50%
Stub's Pattern..... 45%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&5@40&10&5%
The Nettleton Mfg. Co. Reversible Cutting Nippers..... 40%
P., S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, 33⅓%; Elm City, 33⅓%; Paragon, 50%; Lodi, 50%.
Swedish Side, End and Diagonal Cutting Pliers..... 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%
Vaughan & Bushnell Mfg. Co.:
Gas Burner, per doz., 5 in., $2.50; 6 in., $3.00.
Gas, per doz., 7 in., $3.50; 8 in., $3.75; 10 in., $4.50.
Nippers, Horseshoers' Cutting, 40%; Hoof Paring..... 40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10%
Chapin's Imp. Brass Cor..40@40&10%
Pocket Levels.....30@30&10%
Extension Sights.....30@30&10%
Machinists' Levels.....40@40&10%
Disston's Plumbs and Levels....60&10%
Disston's Pocket Levels.....60&10%
C. E. Jennings & Co.'s Iron.....33⅓%
C. E. Jennings & Co.'s Iron, Adjustable ..... 40&7½%
Stanley R. & L. Co..... 40%
Stanley's Duplex..... 30%
Woods' Extension..... 33⅓%

Poachers, Egg—
Buffalo Steam Egg Poachers, ℔ doz., No. 1, $6.00; No. 2, $9.00; No. 3, $9.00; No. 4, $12.00..... 50%

Points, Glaziers'—
Bulk and 1-lb. papers.....*lb.* 10¢
½-lb. papers.....*lb.* 9@10¼¢
¼-lb. papers.....*lb.* 9¾@11¢

Pokes, Animal—
Ft. Madison Hawkeye..... ℔ doz. $3.25
Ft. Madison Western..... ℔ doz. $4.00

Police Goods—
Manufacturers' Lists...25@25&5%
Tower's 25%

Polish—Metal, Etc—
Glasbrite, No. 2, 5 lb can (powder), each, $1.25; ℔ doz., $12.00; No. 2, 10 lb can (cake), each, $2.50; ℔ doz., $24.00.
Prestoline Liquid, No. 1 (½ pt.). ℔ doz., $3.00; No. 2 (1 qu.), $9.00..40%
Prestoline Paste..... 40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ℔ doz. 50¢; ℔ gro. $4.50; ½ lb boxes, ℔ doz. $1.25; 1 lb boxes, ℔ doz. $2.25.
U. S. Liquid, 8 oz. cans, ℔ doz., $1.25.
Barkeepers' Friend Metal Polish, ℔ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ℔ lb 10¢
Black Eagle, Liquid, ½ pt. cans., ℔ doz. 75¢
Black Jack Paste, ¾ lb cans, ℔ gr. $9.00
Black Kid Paste, 5 lb can....each, $0.65
Ladd's Black Beauty Liquid, per 100 tins..... $6.75
Joseph Dixon's, ℔ gr. $5.75..... 10%
Dixon's Plumbago..... ℔ lb 8¢
Fireside ..... ℔ gr. $2.50
Gem, ℔ gr. $4.50..... 10%
Japanese ..... ℔ gr. $3.50
Jet Black..... ℔ gr. $3.50
Peerless Iron Enamel, 10 oz. cans., ℔ doz. $1.50
Wynn's Black Silk:
Paste, cans, ℔ doz., 5 oz., $0.75; ½ lb, $1.00; 1 lb..... $1.75
Paste, ℔ 5 lb can..... $0.70
Liquid, cans, ℔ doz., 6 oz., $0.75; ½ pt., $1.00; 1 pt..... $1.75
Steel Range Enamel, ℔ doz., ¼ pt., $1.00; ½ pt., $1.25.

Poppers, Corn—
1 qt. Square..doz.$0.80; gro.$8.00
1 qt. Round..doz.$0.90; gro.$9.00
1½ qt. Square.doz.$1.00; gro.$10.00
2 qt. Square..doz.$1.20; gro.$12.00

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled ..... 35&10%
Tinned ..... 30&10%

Powder—
In Canisters:
Duck, 1 lb.....*each* 45¢
Fine Sporting, 1 lb....*each* 75¢
Rifle, ½-lb.....*each* 15¢
Rifle, 1-lb.....*each* 25¢
In Kegs:
12½-lb. kegs.....$3.50
25-lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk)..... $6.50
Half Keg (12½ lb bulk)..... $3.50
Quarter Keg (6¼ lb bulk)..... $1.90
Case 24 (1 lb cans bulk)..... $8.50
Half case (1 lb cans bulk)..... $4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk).....	$12.00	$15.00
Half Keg (12½ lb bulk)...	6.25	7.75
Quarter Keg (6¼ lb bulk).	3.25	4.00
Case 24 (1 lb cans bulk)..	14.00	17.00
Half case 12 (1 lb c, bk)..	7.25	8.75

Robin Hood Sm'less Shot Gun..50&20%

Presses—
Fruit and Jelly —
Enterprise Mfg. Co.....20@25%

Seal Presses—
Morrill's No. 1, ℔ doz., $20.00..... 50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops 50%
Miller's Falls, No. 3, ℔ doz., $12.00.. 33⅓&10%
Morrill's No. 1, Nail Puller, ℔ doz. $20.00 ..... 50%
Pearson No. 1, Cyclone Spike Puller, each $30.00..... 50%
Scranton, Case Lots:
No. 2B (large)..... $5.50
No. 3B (small)..... $5.00
Smith & Hemenway Co.:
Diamond B, case lots, ℔ doz., Large, $9.00; Small, $7.50.
Giant No. 1, ℔ doz., $18; No. 1½, $16.50; No. 3, $15..... 33⅓%
Staple Pullers, Utica and Davison 60%
Parrot Tack and Stub Puller, ℔ doz., 75c.: ℔ gro., $6.00

Pulleys, Single Wheel—

Inch	*1½*	*1¾*	*2*	*3*
Awning or Tackle, doz.	*$0.30*	*.45*	*.60*	*1.05*

Hay Fork, Swivel or Solid Eye. doz., ¼ in., $1.25; 5 in., $1.55

Inch	*2*	*2¼*	*2½*
Hot House, doz.	*$0.65*	*.85*	*1.20*
Inch	*1¼*	*1½*	*1¾*	*2*
Screw, doz.	*$0.16*	*.19*	*.23*	*.30*
Inch	*1¾*	*2*	*2¼*	*2½*
Side, doz.	*$0.25*	*.40*	*.55*	*.60*
Inch	*1½*	*1¾*	*2*	*2½*

Stowell's:
Ceiling or End, Anti-Friction..60&10%
Dumb Waiter, Anti-Friction..60&10%
Electric Light..... 60%
Side, Anti-Friction..... 60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz, 1¾ and 2 in.	*16@19¢*
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in.	*17@19¢*

Acme, No. 35..1¾ in., 18½¢; 2 in., 20½¢
Fox-All-Steel, No. 3 and 4, 2 in.... ℔ doz. 50%
Grand Rapids All Steel Noiseless..50%
Ideal ..... 70&5%
Niagara, No. 25, 1¾ in., 18½¢; 2 in., ... 20½¢
No. 26, Troy..1¾ in., 14½¢; 2 in., 16½¢
Star, No. 26...1¾ in., 18½¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher Spout.....75&5@75&10%
Wood Pumps, Tubing, &c..45@50%
Barnes Dbl. Acting (low list)..40&10%
Barnes Pitcher Spout..... 75&10%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co..... $16.00
Daisy Spray Pump..... ℔ doz. $6.50
Flint & Walling's, Fast Mail Hand, (low list)..... 55%
Flint & Walling's Fast Mail (low list) 55%
Flint & Walling's Tight Top Pitcher. ..... 75&10&5%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50..... 30%
Myers' Pumps (low list)..... 40&10%
Myers' Power Pumps..... 40&10%
Myers' Spray Pumps..... 40&10%

Pump Leathers—
Plunger and Lower Valve—Per gro.:

Inch...	*2*	*2¼*	*2½*	*2¾*
	$2.20	*2.50*	*2.75*	*3.00*
Inch...	*3*	*3¼*	*3½*	*3¾*	*4*
	$3.30	*3.60*	*3.85*	*4.10*	*4.40*

Plunger Cup Leathers—Per 100:

Inch...	*2½*	*3*	*3½*	*4*
	$2.75	*3.85*	*5.00*	*6.00*

Punches—
Saddlers' or Drive, good..... *doz.* 50@75¢
Spring, single tube, good quality ..... $1.75@2.00
Revolving (4 tubes)..... *doz.* $3.50@3.75
Bemis & Call Co.'s Cast St'l Drive.50%
Morrill's Nos. 1AA, 1A, 1B, 1C, $15.00 ..... 50%
Hercules, 1 die, each $5.00..... 50%
Niagara Hollow Punches..... 40%
Niagara Solid Punches..... 55&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 33⅓%; Paragon, 50%; Lodi..... 50%
Tinners' Hollow, P., S. & W. Co.33⅓%
Tinners' Solid, P., S. & W. Co. ℔ doz., $1.44..... 50%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron.... 2½@2¾¢
Sliding Door, Wrought Brass, 1¼ in., lb., 36¢..... 30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail..℔ ft. 3¼¢
O. N. T. Rail..... 3¢
Hinge Rail..... .396¢
Griffin's:
xxx, ℔ 100 ft., 1 x 3-16 in., $3.00; 1¼ x 3-16 in., 3.50.
Hinged Hanger, ℔ 100 ft., 1 x 3-16 in., $3.10; 1¼ x 3-16 in., $3.80.
Lane's:
Hinged Track, ℔ 100 ft., 1 in., $3.40; 1¼ in., $3.90.
O. N. T., ℔ 100 ft., 1 in., $3.00; 1¼ in., $3.60; 1½ in., $4.00.
Standard, 1¼ in..... ℔ 100 ft. $4.00
Lawrence Bros.:
℔ 100 ft., No. 201, $4.00; No. 202, $4.00
New York, 1 x 3-16 in., ℔ 100 ft. $3.00
McKinney's:
Hinged Hanger Rail, ℔ ft., 11¢..50%
None Better..... ℔ ft. 3¾¢
Standard ..... ℔ ft. 4¢
Myers' Stayon Track..... 60&10%
Richards' Mfg. Co.:
Common, 1 x 3-6 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65..... 50%
Gauge Trolley Track, ℔ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50..... 60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.
Stowell's:
Cast Rail..... ℔ ft. 2¼¢
Steel Rail, Plain..... 25%
Wrought Bracket, 1 3-16 in.... ℔ ft. 3¢
Wrought Bracket, 1½ x 5-16.. ℔ ft. 7¢
Swett's Hylo, ℔ ft. 11¢..... 60%
P. L. B. Steel Rail..... ℔ 100 ft. $3.00
No. 0, 1 x 3-16..... ℔ 100 ft. $3.00

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Jackson Lawn, 29 and 30 teeth, ℔ doz., net..... $4.25
Cronk's:
New Champion Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00..75%
Victor Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00..... 60%
Queen City Lawn, ℔ doz., 20 teeth, $2.85; 24, $3.00..... net
Anticlog Lawn, ℔ doz..... $4.00
Malleable Garden..... 70&10%
Ideal Steel Garden, ℔ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00..... 80%
Kohler's:
Lawn Queen, 20-tooth....℔ doz. $2.90
Lawn Queen, 24-tooth....℔ doz. $3.00
Paragon, 20-tooth..... ℔ doz. $2.70
Paragon, 24-tooth..... ℔ doz. $2.75
Steel Garden, 14-tooth....℔ doz. $2.40
Malleable Garden, 14-tooth, ℔ doz. $1.75@2.00

Rasps, Horse—
Disston's 75%
Heller Bros.'..... 70&5@70&10&5%
Liveright Bros.' Gold Medal.70&10@75%
New Nicholson..... 70&10@75%
See also Files.

Razors—
Liana Bo-ras-ic..... 60%
Fox Razors, ℔ doz., No. 42, $20.00; No. 44, $20.00; No. 82, Platina, $25.00. } 40%

Red Devil..... 50%
Silberstein:
Carbo Magnetic, $21.00; Griffon, No. 65, $13.50; Griffon, No. 00, $12.00; all other Razors, 40%.

Safety Razors—
Kampfe Bros.:
Star Safety, 25%; Star Interchangeable, 25%; Star Safety Corn, 25%.
Silberstein 40%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo..... 20%
Aluminum, German Silv., Bronze.25%
1240 N, 124 N..... 20%
3004 N, 06 N, 6 RM, G 9..... 25%
4 N 6 PN 24 N, 26 PN..... 20%
2904 P, 33½%; 2904 PN, 33⅓%; 0924 N, 33⅓%; 02064 N, 33⅓%; 002904 PN, 33⅓%; 802 N, 33⅓%.
986 PN, 2904 N, 974 PN..... 25%
5009 PN, 5009 N..... 20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR..... 20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed .....66⅔@66⅔&10%
White Porcelain Enamel....60%
Solid Brass or Bronze Metal, 40&10%

Revolvers—
Single Action.....95¢@$1.00
Double Action, except 44 cal.$1.80
Double Action, 44 caliber.... $2.00
Automatic $3.50
Hammerless $4.00

Riddles, Hardware Grade
16 in......*per doz.*$2.50@$2.75
17 in......*per doz.*$2.75@$3.00
18 in......*per doz.*$3.00@$3.25

Rings and Ringers—
Bull Rings—

	2	*2½*	*3 inch.*
Steel	*$0.70*	*0.75*	*0.80 doz.*
Copper	*$1.15*	*1.35*	*1.75 doz.*

Rea's Improved Self-Piercing, ℔ doz., Copper, 2 in., $1.25; 2½ in., $1.50; 3 in., $1.75.

Hog Rings and Ringers—
Hill's Rings, gro. boxes.$4.00@$4.50
Hill's Ringers, Gray Iron..... *doz.* 50@55¢
Hill's Ringers, Malleable Iron.. *doz.* 70@75¢
Blair's Rings...*per gro.*$4.75@5.25
Blair's Ringers.per doz.$0.60@ .65
Brown's Rings..*per gro.$5.00@5.50*
Brown's Ringers.per doz.$0.60@ .65

Rivets and Burrs—
Copper ..... 33⅓ @35%
Carriage, Coopers', Tinners, &c.: Black ..... 70&10%
Metallic Tinned..... 70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 23@25¢; Tin boxes, 29@32¢.
Tubular, per doz. boxes, 50 count, 72¢; 100 count, 51@58¢.

Rollers—
Acme, Stowell's Anti-Friction.....50%
Cronk's Stay No. 65, $0.90; No. 50 ..... $1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56..... $0.84
Lane's Stay..... 40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57..... 50%
Underwriters', Nos. 59, 60..... 50%
Favorite, No. 54..... 60%
Stowell's Barn Door Stay..℔ doz. $1.00
Swett's Anti-Friction..... 50%
Screw and Spike Stay.....℔ doz. 65¢
Hinge Adjustable Stay.....℔ doz. 90¢

Rope—
Manila, 7-16 in. diam. and larger: Pure .....*lb.,* 13@13½¢
Sisal, 7-16 in. diam. and larger: Pure .....*lb.,* 9¼¢
Sisal, 7-16 in. diam. and larger: No. 2 quality.....*lb.,* 7¾@8¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed .....*lb.,* 7¾@8¢
Pure .....*lb.,* 9¼¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred: Mixed .....*lb.,* 7@7½¢
Pure .....*lb.,* 8¢
Cotton Rope: Best, ¼-in. and larger...18@20¢
*Medium, ¼-in. and larger.*16@17¢
Common, ¼-in. and larger..10¢
In coils, ½¢ advance.
Jute Rope: Thread, No. 1, ¼-in. & up, lb., 9¢
Thread, No. 2, ¼-in. & up, lb., 8½¢
Old Colony Manila Transmission Rope ..... ℔ lb 17½¢

Wire Rope—
Galvanized .....37½&2½%
Plain ..... 45&2½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal..... 20%

Rules
Boxwood .....60@60&10%
Ivory .....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory ..... 25@25&10%
Miscellaneous .....55@55&10%
Stephens' Combination..... 53%
Statfoners' 10%

Keuffel & Esser Co.:
Folding, Wood....35&10%
Folding, Steel....33⅓&10%
Lufkin's Steel....50&10%
Lufkin's Lumber....60%
Stanley R. & L. Co.:
Boxwood....60%
Ivory....45%
Miscellaneous....40%
Zig Zag....40%
Zig Zag, Pin Joint....42½%
Upson Nut Co.:
Boxwood....60@60&10%
Ivory....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—
See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—
Atkins':
Circular....45%
Band....50@50&10%
Butcher Saws....50%
Cross Cuts....35%
One-Man Cross Cut....40%
Narrow Cross Cut....50%
Hand, Rip and Panel....35&5%
Miter Box and Compass....40%
Mulay, Mill and Drag....45%
Chapin-Stephens Co.:
Turning Saws and Frames..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws....30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth..50%
Band, 2 to 18 in. wide....60%
Band, ¼ to 1¼....60%
Crosscuts....45%
Narrow Crosscuts....50%
Mulay, Mill and Drag....50%
Framed Woodsaws....25%
Woodsaw Blades....25%
Woodsaw Rods, Tinned....15%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8....25%
Hand Saws, Nos. 7, 107, 10½, 3, 1, 0, 00, Combination....30%
Compass, Key Hole, &c....25%
Butcher Saws and Blades....30%
C. E. Jennings & Co.'s:
Back Saws....25%
Butcher Saws....30%
Compass and Key Hole Saws..35&5%
Framed Wood Saws....30%
Hand Saws....20&2½%
Wood Saw Blades....35%
Millers Falls:
Butcher Saws....15&10%
Star Saw Blades....15&10%
Massachusetts Saw Works:
Victor Kitchen Saws....40&10&50%
Butcher Saws Blades....35@40%
Peace & Richardson's Hand Saws...30%
Simonds':
Circular Saws....45%
Crescent Ground Cross Cut Saws..30%
One-Man Cross Cuts....40&10%
Gang Mill, Mulay and Drag Saws..45%
Band Saws....50%
Back Saws....25@25&7½%
Butcher Saws....35@35&7½%
Hand Saws....25@25&7½%
Hand Saws, Bay State Brand....45%
Compass, Key Hole, &c..25@25&7½%
Wood Saws....40&7½%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws....50%

Hack Saw Blades and Frames—
Atkins' Hack Saw Blades A A A..25%
Disston's:
Concave Blades....25%
Keystone Blades....35%
Hack Saw Frames....30%
Simonds File Co....35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180....40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades....40&10%
Griffin's Hack Saw Frames..35&5&10%
Griffin's Hack Saw Blades....35&5&10%
Star Hack Saws and Blades....15&10%
Sterling Hack Saw Blades....30&10&5%
Sterling Hack Saw Frames..30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00..10%
Victor Hack Saw Blades....25%
Victor Hack Saw Frames....40%

Scroll—
Barnes, No. 7, $15....25%
Barnes' Scroll Saw Blades....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20....20%
Lester, complete, $10.00....15&10%
Rogers, complete, $3.50 and $4.00....15&10%

Scales—
Family, Turnbull's....50@50&10%
Counter:
Hatch, Platform, ½ oz. to 4 lbs....doz. $5.50
Two Platforms, ½ oz. to 8 lbs....doz. $16.00
Union Platform, Plain..$1.70@1.90
Union Platform, Stpd..$1.85@2.15
Chatillon's:
Eureka....25%
Favorite....40%
Crocers' Trip Scales....50%
Chicago Scale Co.:
The Little Detective....25 lbs 50%
Union or Family No. 2....60%
Portable Platform (reduced list)..50%
Wagon or Stock (reduced list)..25@35%
The Standard Portables....45%
The Standard R. R. and Wagon....50&10%

Scrapers—
Box, 1 Handle....doz. $2.00@2.25
Box, 2 Handle....doz. $2.50@2.60
Ship....Light, $2.00; Heavy, $4.50
Adjustable Box Scraper (S. R. & L. Co.), $6.00....45%
Chapin-Stephens Co., Box...30@30&10%

Screws—Bench and Hand
Bench, Iron, doz., 1 in., $2.50@2.75; 1⅛, $3.00@3.25; 1¼, $3.50@3.75
Bench, Wood....20@20&10%
Hand, Wood....20@20&10%
R. Bliss Mfg. Co., Hand..20&5@20&10%
Chapin-Stephens Co., Hand....20%

Coach, Lag and Hand Rail—
Lag, Cone Point, list Oct. 1, '99....75&15%
Coach, Gimlet Point, list Oct. 1, '99....75&10%
Hand Rail, list Jan. 1, '81....70&10@75%

Jack Screws—
Standard List....75%
Millers Falls....50&10&10%
P. S. & W....50%
Swett Iron Works....75@80%

Machine—
List Jan. 1, '98:
Flat or Round Head, Iron....50@50&10%
Flat or Round Head, Brass....50@50&10%

Set and Cap—
Set (Iron)....75&10&7½%
Set (Steel), net advance over Iron....25%
Sq. Hd. Cap....70&10&7½%
Hex. Hd. Cap....70&10&7½%
Rd. Hd. Cap....50&7½%
Fillister Hd. Cap....60&7½%

Wood—
List July 23, 1903.
Flat Head, Iron....87½&5@..%
Round Head, Iron....85&5@..%
Flat Head, Brass....82½&5@..%
Round Head, Brass....80&5@..%
Flat Head, Bronze...77½&5@..%
Round Head, Bronze..75&5@..%
Drive Screws....87½&5@..%

Scroll Saws—
See *Saws, Scroll.*

Scythes—
Per doz.
Grass, No. 1, Plain....$6.25@6.75
Clipper, Bronzed Webb..$6.50@7.00
No. 3 Clipper, Pol'd Webb..$6.75@7.25
No. 6 Clipper and Solid Steel, $7.00@7.50
Bush, Weed and Bramble, No. 2. $6.50@7.00
Grain, No. 1....$8.25@8.75
Bronzed Webb, No. 1..$8.50@9.00
Nos. 3 and 4 Clipper, Grain..$8.75@9.25
Solid Steel, No. 6....$9.25@9.75

Seeders, Raisin—
Enterprise....25@30%

Sets— Awl and Tool—
Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7....50%
C. E. Jennings & Co.'s Model Tool Holders....30%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18....15&10%

Garden Tool Sets—
Ft. Madison Three Plows, Hoe, Rake and Shovel....℔ doz sets $9.00

Sets, Nail—
Octagon....gro. $3.50@3.75
Buck Bros....27½%
Cannon's Diamond Point, ℔ gro, $12, 40&10%
Mayhew's....℔ gro. $9.00
Snell's Corrugated, Cup Pt....40&10%
Snell's Knurled, Cup Pt....40&10%
Victor Knurled Cup Pt....℔ gro. $7.50

Rivet—
Regular list....75@75&10%

Saw—
Atkin's:
Criterion....40%
Adjustable....40%
Disston's Star, Monarch and Triumph....30%
Morrill's No. 1....$15.00
Nos. 3 and 4, Cross Cut....$20.60
No. 5, Mill....$20.00
Nos. 10, 11, 95....$15.60
No. 1 Old Style....$10.00
Special....$16.25
Giant Rotal Cross Cut....℔ doz. $8.00
Royal, Hand....℔ doz. $4.50
Taintor Positive....℔ doz. $6.75

Shaving—
Fox Shaving Sets, No. 30....℔ doz., net, $24.00
Smith & Hemenway Co.'s....60%

Sharpeners, Knife—
Chicago Wheel & Mfg. Co....70%
Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ℔ doz....$1.50
Mounted Kitchen Sand Stone, ℔ doz....$1.50
Natural Grit Carving Knife Hones, ℔ doz....$3.00
Quick Cut Emery Carving Knife Hones, ℔ doz....$1.50
Quick Edge Pocket Knife Hones, ℔ doz....$2.50

Skate—
Smith & Hemenway Co., Eureka..20%

Shaves, Spoke—
Iron....doz. $1.10@1.25
Wood....doz. $1.75@2.25
Bailey's (Stanley R. & L. Co.)....45%
Razor Edge (Stanley R. & L. Co.), Iron, 50%; Wood....55%
Chapin-Stephens Co....30@30&10%
Goodell's ℔ doz. $9.00....15&10%
Wood's F1 and F2....50%

Shears—
Cast Iron..	7	8	9 in.
Best	*$16.00*	*18.00*	*20.00 gro.*
Good	*$13.00*	*15.00*	*17.00 gro.*
Cheap	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality Jap....70@70&10%
Best quality, Nickel..60@60&10%
Fair quality, Jap....80@80&5%
Fair quality, Nickel..75@75&10%
Tailors' Shears....40@40&10%
Acme Cast Shears....40@40&5%
Heinisch's Tailor's Shears....10%
Wilkinson Shear & Cutlery Co.:
Sheep, 1900 list....30&10&5%
Grass....50&10%
Horse or Mule....50&10%

Tinners' Snips—
Steel Blades....20&5@20&10%
Steel Laid Blades....40&10@50%
Forged Handles, Steel Blades, Berlin, 50%
Heinisch's Snips....40%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 in....50%
Niagara Snips....40%
P., S. & W. Forged Handles....20%

Pruning Shears—
Cronk's Hand Shears....33⅓%
Cronk's Wood Handle Shears....33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00....25%
Disston's Pruning Hook only, ℔ doz. $12.00....25%
John T. Henry Mfg. Co.: Pruning Shears, all grades....40%
P., S. & W. Co....30%
Wilkinson Shear & Cutlery Co.: Hedge, Wilcut Brand,....60&10%
Lawn and Border, Wilcut Brand, 60&10%

Sheaves—Sliding Door—
Stowell's Anti-Friction....50%
Reading....40%
R. & E. list....15%
Wrightsville Hatfield Pattern....87½%

Sliding Shutter—
Reading list....40%
R. & E. list....10%

Shells—Shells, Empty—
Brass Shells, Empty:
Climax, 10 and 12 gauge....65&10%
Club, Rival, 65&5%; First Quality, 60&5%
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, 25&10%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade, 25&5%
Union, League, 12 and 12 gauge; Rival Grade....25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge....20&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade..20%
Expert, 10, 12, 16 and 20 gauge, 33⅓&5%
Robin Hood, Low Brass....20&5%
Robin Hood, High Brass....30&5%
Indian, for Black Powder....25&5%

Shells, Loaded—
Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade....40&5%
Loaded with Smokeless Powder, high grade....40&10&10%
Robin Hood:
Smokeless Robin Hood, Low Brass....40&10%
Smokeless Comets, High Brass, 40&10&10&5%
Indian, Black Powder....40&5%
Winchester:
Smokeless Repeater Grade....40&5%
Smokeless Leader Grade...40&10&10%
Black Powder....40%

Shingles, Metal— Per Sq.
Edwards Mfg. Co.:

	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:

	Tin Painted.	Galv.
Dixie, 14 x 20 in.	$4.25	$5.50
Dixie, 10 x 14 in.	4.50	6.00
Dixie, 7 x 10 in.	5.00	6.75

Shoes, Horse, Mule, &c.—
F.o.b. Pittsburgh:
Iron....per keg. $4.10
Steel....per keg. $3.85
Burden's, all sizes....℔ keg $3.90

Shot—
25-lb. bag.
Drop, up to B....$1.95
Drop, B and larger....2.20
Buck....2.20
Chilled....2.20
Dust....2.40

Shovels and Spades—
Association List, Nov. 15, 1902..40%

Snow Shovels—
Long Handle....$2.75@3.00
Wood and Mail, D. Handle, $3.25@3.50

Sieves and Sifters—
Hunter's Imitation....gro. $9.50@10.00
Hunter's Genuine....per gro. $12.00@12.50

Buffalo Metallic Blued, R. M. Co., ℔ gr.		
14&16	16&18	18&20
$13.20	$13.50	$14.40

Sieves, Seamless Metallic
Per dozen.

Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested....doz. $0.90@0.95
Mesh 20, Nested....doz. $1.00@1.05
Mesh 24, Nested....doz. $1.30@1.40

Sinks, Cast Iron—
Painted, Standard list:
12 x 12 to 22 x 36 in....60%
20 x 40 to 24 x 50 in....50%
24 x 60 to 24 x 120 in....30%
Barnes' low list:
Up to and including 20 x 36 in....50%
20 x 40 to 24 x 50 in....45%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—
Cast Iron....70@75&10%
Steel....40@45%

Slates, School—
Factory Shipments.
"D" Slates....50@50&10%
Eureka, Unexcelled Noiseless..60&5 tens
Victor A, Noiseless..60&5 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—
German....40@40&10%
Covert Mfg. Co.:
Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%
High Grade, 40%; Trojan....40%
Jockey....25%
Oneida Community:
Harness Snaps, 1 inch....60&5%
Swivel Snaps....60%
Swivels....50%

Snaths—
Scythe....50%

Snips, Tinners—See *Shears.*

Spoons and Forks—
Silver Plated—
Good Quality....50&10@60&5%
Cheap....60@60&10%
International Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Hamilton....50&10%
Rogers & Bro., William Rogers' Eagle Brand....50&10%
Anchor, Rogers Brand....60%
Wm. Rogers & Son....60&10%

Miscellaneous—
German Silver....60@60&5%
Cattaraugus Cutlery Co.:
Seneca Silver....50%

Tinned Iron—
Teas....per gro. 45@50¢
Tables....per gro. $0.50@$1.00

Springs— Door—
Bardsley's Spring and Check....40%
Chicago (Coil)....40&10%
Gem (Coil)....20%
Pullman (Coil)....35%
Reliance (Coil)....40&10%
Star (Coil)....30%
Torrey's Rod, 30 in....℔ doz. $1.10

Carriage, Wagon, &c.—
1¼ in. and Wider: Per lb
Black....4¼@4½¢
Half Bright....4¼@4½¢
Bright....4¾@5¢
Painted Seat Springs:
1½ x 2 x 26....per pr. 40@42¢
1½ x 3 x 28....per pr. 60@65¢

Sprinklers, Lawn—
Enterprise....25@30%
Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $20....30%
Pleuger & Henger Mfg. Co.: Cactus, 65&5%; Japanese, 70&5%; Nationals, 60&5%.

Squares—
Nickel plated.. } *List Jan. 5, 1900.*
Steel and Iron.. } *75@—%*
Rosewood Hdl. Try Square and T-Bevels....60&10&10@70%
Iron Hdl. Try Squares and T-Bevels....40&10@40&10&10%
Disston's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Stock and Bevel....15%
Winterbottom's Try and Miter, No. 1, 35%; No. 2....45%

Squeezers, Lemon
Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap....doz. $1.00
Good Grade....doz. $1.25
Tinned Iron....doz. $0.75@1.25
Iron, Porcelain Lined...doz. $1.75

Staples—
Barbed Blind....lb. 6@6½¢
Electricians', Association list..80&10&10&10%
Fence Staples, Plain, $2.25; Galvanized....$2.55
Poultry Netting Staples....per lb. 3¼@3½¢

Steels, Butchers'—
Dick's....30%
Foster Bros.'....30%
C. & A. Hoffmann's....40%

Steelyards— ....30@30&10%

Stocks and Dies—
Blacksmiths'....50@50&10%
Curtis Rev'bie Ratchet Die Stock..25%
Derby Screw Plates....25%
Green River....25%
Lightning Screw Plate....25%
Little Giant....25%
Reece's New Screw Plates....25%

Stoners, Cherry—
Enterprise....25@30%

Stones—Oil, &c.
Chicago Wheel & Mfg. Co., 1904 list:
Gem Oil, Double Grit....65%
Gem Axe, Single or Double Grit..65%
Gem Slips....65%
Gem Razor Hones....50%
Pike Mfg. Co., 1904 list: ℔ lb. 25%
Arkansas St. No. 1, 3 to 5½ in..$2.80
Arkansas St. No. 1, 5½ to 8 in..$3.50
Arkansas Slips No. 1....$4.00
Lily White Washita, 4 to 8 in..60¢
Rosy Red Washita, 4 to 8 in..60¢
Washita St., Extra, 4 to 8 in..50¢
Washita St., No. 1, 4 to 8 in..40¢
Washita St., No. 2, 4 to 8 in..30¢
Lily White Slips....90¢
Rosy Red Slips....90¢
Washita Slips, Extra....80¢
Washita Slips, No. 1....70¢
Washita Slips, No. 2....40¢
India Oil Stones (entire list)..33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit....33⅓%
Quickcut Emery and Corundum Axe Stone, Double Grit....33⅓%
Quickcut Emery Rubbing Bricks..33⅓%
Hindostan No. 1, R'g'lar..℔ lb 8¢
Hindostan No. 1, Small..℔ lb 10¢
Axe Stones (all kinds)....
Turkey Oil Stones, Extra, 5 to 8 in....℔ lb 80¢
Queer Creek Stones, 4 to 8 in..20¢
Queer Creek Slips....40¢
Sand Stone....6¢

Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem, ₩ gro., 10 in., $8.00; 12 in., $10.80.
Norton Alundum Scythe Stones:
Less than 10 gross lots... ₩ gro. $6.00
Lots of 10 gross or more,.. ₩ gro. $4.50
Pike Mfg. Co., 1901 list:
Black Diamond S. S.. ₩ gro. $12.00
Lamoille S. S..... ₩ gro. $11.00
White Mountain S. S. ₩ gro. $9.00
Green Mountain S. S. ₩ gro. $6.00
Extra Indian Pond S.S. ₩ gro. $7.50
No. 1 Indian Pond S.S. ₩ gro. $7.00
No. 2 Indian Pond S.S. ₩ gro. $4.50
Leader Red End S. S. ₩ gro. $4.50
Quick Cut Emery.... ₩ gro. $10.00
Pure Corundum,..... ₩ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓% } Dis.

Stoppers, Bottle—

Victor Bottle Stoppers..... ₩ gro. $9.00

Stops— Bench—

Millers Falls..... 15&10%
Morrill's, ₩ doz., No. 1, $10.00..... 50%
Morrill's, No. 2, $12.50..... 50%

Door—

Chapin-Stephens Co..... 60@60&10%

Plane—

Chapin-Stephens Co..... 20%

Straps— Box—

Cary's Universal, case lots....20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket ..... doz. $1.00
Bullard, ₩ doz..... $1.00
Excelsior Stretcher and Tack Hammer Combined, ₩ doz. $6.00..... 20%

Woven Fence—

Franklin..... ea., $3.75

Strops, Razor—

Star Diagonal Strop..... 25%

Stuffers, Sausage—

Enterprise Mfg. Co..... 25@23&7½%
National Specialty Co., list Jan. 1, 1902 ..... 30&5%

Sweepers, Carpet—

	₩ doz.
National Sweeper Co.:	
Louis XV, Roller Bearing, Gold Plated	$20.00
Hepplewhite, Roller Bearing, Silver Plated	$72.00
Sheraton, Roller Bearing, N'kel.	$60.00
Ye Mission, Roller Bearing, Oxidized Coppered	$36.00
Transparent, Roller Bearing, Plate Glass top, Nickeled	$36.00
National Queen, Roller Bearing, Fancy Veneers	$27.00
Loyal, Roller Bearing, Veneers, Nickeled	$25.00
Triple Medal, Roller Bearing, Nickeled	$24.00
Marion, Roller Bearing, N'kel.	$24.00
Marion Queen, Roller Bearing, Nickeled	$21.00
Monarch, Roller Bearing, N'kel.	$22.00
Monarch, Roller Bearing, Jap.	$20.00
Perpetual, Regular B'r'gs, N'kel.	$20.00
Perpetual, Regular B'r'gs, Jap.	$18.00
Monarch Extra (17 in. case), Roller Bearing, Nickeled	$36.00
Monarch Extra (17 in. case), Roller Bearing, Japanned	$33.00
Auditorium (26 in. case), Roller Bearing, Nickeled	$54.00
Mammoth (30 in. case), Roller Bearing, Nickeled	$60.00

NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots.
Streator Metal Stamping Co.:

Eureka Japanned	₩ doz. $15.00
Model E, Sanitaire	₩ doz $25.00
Model A, Sterling	₩ doz. $25.00
Model B, Sterling, Nickeled	₩ doz. $23.00
Model B, Sterling, Japanned	₩ doz. $21.00
Model C, Sterling	₩ doz. $21.50
Model D, Sterling	₩ doz. $19.50

Tacks, Finishing Nails, &c.

New List, May 1, 1905.
American Carpet Tacks..90&30%
American Cut Tacks.....90&30%
Swedes Cut Tacks.....90&30%
Swedes' Upholsterers'....90&10%
Gimp Tacks.....90&10%
Lace Tacks.....90&10%
Trimmers' Tacks.....90&30%
Looking Glass Tacks.....65%
Bill Posters' and Railroad Tacks, 90&10%
Hungarian Nails.....80&20%
Finishing Nails.....70%
Trunk and Clout Nails.....80%

NOTE.—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10&5% is given on light weights.

Miscellaneous—

Double Pointed Tacks..... 90&5 *or 5 tens*
See also Nails, Wire.

Tanks, Oil and Gasoline—

Each R. M. Co.: Gal.	Oil Emerald	Oil Queen City
50	$3.40	$3.65
60	$4.25	$4.50

Wilson & Friend Co.: Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin ..50@—%
Patent Leather.....25@30&5%
Steel ..... $3 1-3&5%
Chesterman's .....25@25&5%
Keuffel & Esser Co.:
Favorite, Ass Skin.....40&10@50%
Favorite, Duck and Leather..... 25&5@25&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkin's:
Asses' Skin.....40&10@50%
Metallic .....30@30&5%
Patent Bend, Leather....25&5@25&10%
Pocket .....40@40&5%
Steel .....33⅓@35%
Wiebusch & Hilger:
Chesterman's Metallic, No. 34L, etc. 25%
Chesterman's Steel, No. 1038L, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case.....80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop.....80&10&5%
Monitor, Cross Head, &c. 70&2½%

Brick Ties—

Niagara Brick Ties..... 25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White..... 20@20&5%

Hay—

Myers' Hay Tools..... 50%
Stowell's Hay Carriers, 50%; Hay Forks, 50%; Fork Pulleys, 50%.

Miniature—

Smith & Hemenway Co.'s, Davidson 25%

Saw—

Atkins' Cross Cut Saw Tools....35&5%
Simonds' Improved..... 33⅓%
Simonds' Crescent..... 25%

Ship—

L. & I. J. White..... 35%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida.....70&10%
Newhouse .....40@45&5%
Hawley & Norton..... 65%
Victor .....70&10%
Oneida Community Jump..... 50%

Mouse and Rat—

Mouse, Wood, Uhoker, doz. holes 12¢
Mouse, Round or Square Wire. doz. 85@80¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, ₩ doz., $13.25; case of 24 ..... $11.50 doz.
No. 3, Rat, ₩ doz., $6.50; case of 50 ..... $5.75 doz.
No. 3½, Rat, ₩ doz. $5.25; case of 72 ..... $4.70 doz.
No. 4, Mouse, ₩ doz. $3.85; case of 150 ..... $3.00 doz.
No. 5, Mouse, ₩ doz. $3.00; case of 150 ..... $2.25 doz.

Trimmers, Spoke—

Wood's E 1..... 50%

Trowels—

Disston Brick and Pointing... .....25%
Disston Plastering..... 20%
Disston "Standard Brand" and Garden Trowels..... 30%
Kohler's Steel Garden Trowels, ₩ gro., 5 in. $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels.. ₩ gro. $6.00
Rose Brick and Plastering.....25&5%
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern..... 50&10%
Western Pattern..... 60&10%
Handy Trucks..... ₩ doz. $16.00
Grocery ..... ₩ doz. $15.00
Daisy Stove Trucks, Improved Pattern ..... ₩ doz. $18.50
McKinney Trucks..... each $10.00
Model Stove Trucks..... ₩ doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.

No.	0	1	2	3
Galvanized.	$64	$76	$84	$96

10&5%
Galvanized Wash Tubs (R. M. Co.):

No.	1	2	3	10	20	30
Per doz., net.	$5.70	6.30	7.20	6.60	7.20	8.10

Twine, Miscellaneous—

Flax Twine:
*No. 9, ¼ and ½-lb. Balls.*23@25¢
*No. 12, ¼ and ½-lb. Balls.*21@22¢
*No. 18, ¼ and ½-lb. Balls.*18@20¢
*No. 24, ¼ and ½-lb. Balls.*17@19¢
*No. 36, ¼ and ½-lb. Balls.*16@18¢
Chalk Line, Cotton ¼-lb. Balls ..... 26@31¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz ..... 11@19¢
*Cotton Wrapping, 5 Balls to lb., according to quality...*15½@23¢
American 2-Ply Hemp, ¼ and ½-lb. Balls.....14½@15½¢
American 3-Ply Hemp, 1-lb. Balls .....15½@16½¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine).10½@11½¢
India 3-Ply Hemp, 1-lb. Balls 10½@11½¢
India 3-Ply Hemp, 1½-lb. Balls. 10@11¢
2, 3, 4 and 5-Ply Jute, ½-lb. Balls .....13½@14½¢
*Mason Line, Linen, ½-lb. Bls.*17¢
No. 26½ Mattress, ½ and ¼-lb. Balls, according to quality, 30@60¢
Wool, 3 to 6 ply....B 9¢; A 10¢

Vises—

Solid Box.....50&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable..... 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co..... 40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50.
Machinist and Tool Makers' No. 4A, $12.50; No. 6A, $10.00; No. 10A, $22.50.
Presto Quick Acting Adjustable Jaw, 25@25&10%; Solid Jaw, 35@35&10%
Tiger Machinists'..... 40%
Fisher & Norris Double Screw, net, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00.
Fulton Mach. & Vise Co.:
Reed, Swivel..... 25%
Star, Solid Jaw..... 40%
Hollands':
Machinists' .....40@40&5%
Keystone ..... 65&10&10%
Lewis Tool Co.:
Adjustable Jaw..... 30%
Monarch, 50%; Solid Jaw..... 50%
Massey Vise Co.:
Clincher 40%
Perfect, 15%; Lightning Grip.....15%
Merrill's 20%
Millers Falls Oval Slide Pattern.60&10%
Parker's:
Victor, 20@25%; Regulars.....20@25%
Vulcan's .....40@45%
Combination Pipe..... 55@60%
Prentiss .....20@25%
Snediker's X. L..... 33⅓%
Stephens' 33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, ₩ doz., $24.00, 30%; Clamps..... 30%
Perfection Saw Clamps, ₩ doz....$4.50
Reading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3..... 50%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed 25%
Star 40%
Massey Vise Co.:
Lightning Grip, 15%; Perfect.....15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $9.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe..... 40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.

Wads—*Price per M.*

B. E., 11 up	.....60¢	Dis. 15%
B. E., 9 and 10	.....70¢	
B. E., 8	.....80¢	
B. E., 7	.....80¢	
P. E., 11 up	.....$1.00	
P. E., 9 and 10	..... 1.25	
P. E., 8	..... 1.50	
P. E., 7	..... 1.50	
Ely's B. E., 11 and larger.		$1.70@1.75
Ely's P. E., 12 to 20		....$3.00@3.12

Ware, Hollow—

Cast Iron, Hollow—

Stove Holloww Ware:
Enameled .....45&10%
Ground .....50&5%
Plain or Unground.....60%
Country Hollow Ware, per 100 lbs. $3.00
White Enameled Ware:
Maslin Kettles.....65&10%
Covered Wares:
Tinned and Turned.....35&10%
Enameled .....45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware..... 60%
Iron Clad Ware..... 70&10%
Lava, Enameled..... 40&10%
Never Break Enameled..... 50%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	.45¢	50¢	55¢	65¢

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles..... 60%
Porcelained .....50&5@50&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles..... 60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles..... 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

	₩ doz.
Solid Zinc:	
Crescent, family size, bent frame.	$3.70
Red Star, family size, stationary protector	$3.70
Double Zinc Surface:	
Saginaw Globe, family size, stationary protector	$3.25
Cable Cross, family size, stationary protector	$3.40
Single Zinc Surface:	
Naiad, family size, open back, perforated	$2.90
Single Saginaw Globe	$2.75
Brass Surface:	
Brass King, Single Surface, open back	$3.65
Nickel Plate Surface:	
No. 1001 Nickel Plate, Single Surface	$3.65
Glass Surface:	
Glass King, Single Surface, open back	$3.65
Enamel Surface:	
Enamel King, Single Surface, ventilated back	$3.65

Washers—Leather, Axle—

Solid .....80&10@80&10&10%
Patent .....90@90&5%
Coil: ¼ ⅜ ½ ⅝ ¾ *Inch.*
10½¢ 11½¢ 12½¢ 16¢ per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers....$5.90 5.00 3.70 3.50 3.30
The above prices are based on $5.50 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾&2¢

Weather Strip—

Flexible Felt—

Lined, per 100 ft., $2; $3; $4.....40&10%
Moore's Unlined, per 100 ft., $2; $3; $4 ..... 50&10%

Wedges—

Oil Finish.....lb., ..@3¢

Weights—Hitching—

Covert Mfg. Co..... 30&2%

Sash—

Per ton, f.o.b. factory:
Eastern District.....$30.00
Southern Territory.$23.00@$24.00
Westerwand Central Districts ..... $22.00@$28.00

Wheels, Well—

8-in., $1.55; 10-in., $2.00; 12-in., $2.50; 14-in., $4.00.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....80%
10 to 18.....80&2½%
19 to 26.....80&7½%
27 to 36.....80&2½%
Galvanized:
6 to 9.....75&5%
10 to 14.....75&7½%
15 to 16.....72½&10&2½%
19 to 26.....75%
27 to 36.....72½%
Coppered:
6 to 9.....75&5%
10 to 14.....75&7½%
15 to 18.....72½&10&2½%
19 to 26.....75&10&5%
27 to 36.....75%
Tinned:
6 to 14.....75&10&2½%
15 to 18.....75&7½%
Brass.....24¢ *lb., base*
Copper .....32¢ *lb., base*
Cast Steel Wire.....50%

Spooled Wire—

Annealed and Tinned, 70&10@75&10%
Brass and Copper..60&10@65&10%
Retailers' Assortments, per box, $2.25@$2.50

Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods.....90&10%
Brass Wire Goods.....85&25%
Brass Cup and Shoulder Hooks, 80&15%

Wire Cloth and Netting—

Galvanized Wire Netting..80&10%
Painted Screen Cloth, 100 ft., $1.30@—
Standard Galv. Hardware Grade:
*Nos. 2, 2½ & 3 Mesh, sq. ft.*3¼¢
Nos. 4 and 5 Mesh, sq. ft..3½¢
No. 6 Mesh, sq. ft.....3¾¢
No. 8 Mesh, sq. ft.....4¼¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural .....75@75&10%
Alligator or Crocodile..70&10@75%
Baxter Pattern S Wrenches... 70&5@70&10%
Drop Forged S.....45@45&5%
Acme .....60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut..... 50%
Combination Black..... 40&5%
Merrick Pattern..... 50%
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"....40&10&10&5&5%
Donohue's Engineer..... 40&10%
Eagle 70%
Elgin Wrenches, ₩ doz..... $6.25
Elgin Rethreading Attachment, only with one die, ₩ doz..... $6.25
Elgin Extra Dies, ₩ doz..... $3.00
Elgin Extra Jaws, ₩ doz..... $1.75
Elgin Monkey Wrench Pipe Jaws, ₩ doz..... $2.10
Gem Pocket..... 70%
Hercules 70%
W. & B. Machinist:
Case lots..... 50&5%
Less than case lots..... 50%
W. & B. Railroad Special:
Case lots..... 50%
Less than case lots.....40&10&5%
Solid Handles, P., S. & W.....50&5%
Stillson 65%
Vulcan Chain..... 50%
Vaughan & Bushnell Mfg. Co., Handy, 70%; Always Ready..... 50%

Fruit Jar—

Triumph Fruit Jar Wrench, 5 gross lots, ₩ gross, $7.50; ₩ doz..... $0.80

Wrought Goods—

Stables, Hooks, &c., list March 17, '02.....87½@87½&10%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters'..... list net

Zinc—

Sheet.....*per 100 lb., $8.85@$9.10*